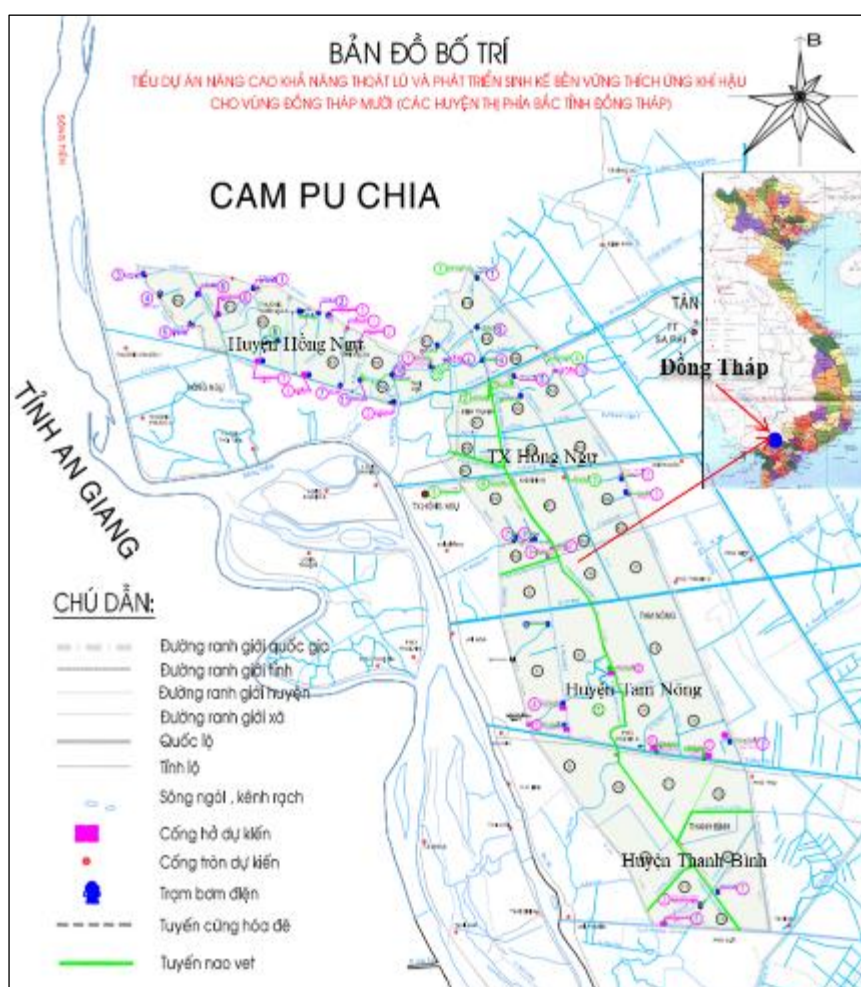


PEOPLE'S COMMITTEE OF DONG THAP PROVINCE
DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT



**PROJECT: MEKONG DELTA INTEGRATED CLIMATE RESILIENCE AND
SUSTAINABLE LIVELIHOODS (MD-ICRSL)**
**SUBPROJECT: IMPROVING THE ABILITY OF FLOOD DRAINAGE AND
DEVELOPING STABLE LIVELIHOODS, CLIMATE CHANGE
ADAPTATION IN THE PLAIN OF REED (THE NORTHERN DISTRICTS OF
DONG THAP PROVINCE)**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT
(Final version approved by the WB on 22 May 2019)



Dong Thap, February 2019

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ABBREVIATIONS AND ACRONYMS

CPMU	Central Project Management Unit of CPO
CPO	Central Project Office (MARD)
CSC	Construction Supervision Consultant
CSEP	Contract Specific Environmental Plan
DARD	Department of Agriculture and Rural Development
DONRE	Department of Natural Resources and Environment
PDWR	Provincial Division of Water Resources
ECOP	Environmental Codes of Practice
EHSO	Environment Health and Safety Officer
EMC	Environmental Management Consultant
ESMP	Environmental and Social Management Plan
EIA	Environmental and Social Impact Assessment
ESC	Environment Safeguard Coordinator
ESMF	Environment and Social Management Framework
ESU	Environment and Social Unit
GOV	Government of Vietnam
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
HH	Household
ICMB 10	Infrastructure Construction Management Board No. 10
IMC	Independent Monitoring Consultant
MARD	Ministry of Agriculture and Rural Development
MD-ICRSL	Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods
OP/BP	Operation Policy/Bank Procedures
PPC	Provincial People's Committees
PMU	Project Management Unit
PPMU	Provincial Project Management Unit
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RA	Residential area
RL	Residential line
S/A	Summer – Autumn

SIWRR	Southern Institute of Water Resources Research
SSC	Social Safeguard Coordinator
UXO	Unexploded Ordnance
WB	World Bank
W/S	Winter – Spring
NGO	Non-Governmental Organization

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INTRODUCTION

1. THE ORIGIN OF THE SUBPROJECT

The Mekong Delta (MD) is considered a hotspot of climate change and sea level rise as a consequence of the global warming effect. Due to the natural features of the Mekong Delta, the delta is low-lying and flat, at about 1.0 to 1.8 m above sea level, covering an area of nearly 4 million ha. In terms of socio-economic status, the Delta is home to nearly 20 million people, the largest agricultural and fishery region in Vietnam. The MD has 3 main ecological zones: flood-prone areas (4-7 months); middle-zone (the freshwater alluvium, shallow inundation, mild salinity intrusion) and coastal areas (over 6 months of salinity intrusion).

Located in the upstream flood-prone area of the MD, the north of Dong Thap province are Hong Ngu district, Hong Ngu town, Tam Nong, Thanh Binh, etc. Two key economic sectors are agricultural production (focusing on rice and fruit) and aquaculture, including fishery. These two sources of livelihood depend heavily on climate, water, and land resource. Any change in these three resources will affect the ecology and livelihoods of the majority of the population living in the area.

The use of financial resources to mitigate and adapt to climate change needs to focus on capacity building activities for the poorer helping the communities in the project area to integrate natural conditions into socio-economic development plans; investment in infrastructure systems, especially irrigation (dredging of canals, embankments, sewers, pumping stations and electrical systems) to actively supply water in dry seasons, wash the fields at the beginning of rainy seasons and control rational flood water to obtain sediments and natural fishery (fish, shrimp) in fields creating safe production, gradually shift 3-crop rice in the area and neighboring to flood-adaptive farming method. In parallel with the investment in technical infrastructure, livelihood models such as technical assistance (breed, breeding techniques, etc.), market access and branding are very important.

The purpose of the project investment to stabilize the livelihoods of people living in the North of Dong Thap, where has no full dike and annual floods are frequent is to solve social justice in production with the areas are fully invested for 3-rice-crop production. Investment in infrastructure and livelihood models for safe production in floods will contribute to the employment of 15,651 households that will be highly productive in terms of socio-economic conditions.

In addition, the project area stretching from Hong Ngu district, Hong Ngu town along two canals: Hai Thang Chin and Binh Thanh-Phu Thanh to Thanh Binh district will form a flood drainage route from upstream to downstream before reaching Tien River. This is a very meaningful task in terms of natural conditions as the Tram Chim National Park (NP), the wetland biodiversity of the MD, is located next to the project site.

In addition, the Dong Thap Provincial People's Committee (PPC) has approved the investment plan for an important project: Vietnam-Sustainable Agriculture Transformation Project (VnSAT). So, there will be a sustainable agro-forestry production area, contributing to livelihoods stability of people in the northern districts of Dong Thap.

Thus, the construction investment of the subproject “*Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)*”, under the project “*Mekong Delta Integrated*

Climate Resilience and Sustainable Livelihoods (MD-ICRSL)” using the World Bank (WB) loan is necessary, in accordance with planning. The subproject meets the current production requirements as well as production conversion for floodplain areas in order to stabilize livelihoods, improve living standards for local communities, and contribute to the sustainable development of the subproject area in the context of climate change. The investment is beneficial for society, economy and environment and no future regrets.

Besides the urgent benefits provided by the subproject as mentioned above, the implementation of the subproject will also cause some negative impacts on the natural and socio-economic environment of the sub-region.

Pursuant to the provisions in Section 31: Projects on construction of irrigation, water supply, and drainage works in service of agriculture, forestry and fishery: Irrigation and drainage, water supply for an area of 500 hectares or more in Appendix II In Decree No. 18/2015/ND-CP, the subproject *"Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)"* requires an Environmental Impact Assessment (EIA) report.

Furthermore, this subproject belongs to the ICRSL project, the implementation of the environmental safeguard policy of this subproject will be in line with the guidance in the Environmental and Social Management Framework (ESMF) approved in Decision No. 1262/QĐ-BNN-KHCN dated 12/4/2016 of the Ministry of Agriculture and Rural Development (MARD). Therefore, the owner had prepared a safety policy screening and the results showed that the subproject needs to prepare an Environmental and Social Impact Assessment (ESIA) to WB for approval.

The purpose of this ESIA report is to figure out the impacts of the subproject implementation on the environment thereof proposing solutions to minimize and mitigate negative influences and harmonize investment objectives with environmental protection. This is also an opportunity for scientists, investors and decision makers to fully debate about the major impacts, thereof building an appropriate plan to minimize them.

2. COMPETENT ORGANIZATION TO APPROVE FEASIBLE STUDY, INVESTMENT PROJECT OR EQUIVALENT DOCUMENT

- Name of organization: People's Committee of Dong Thap Province
- Address: No. 12, Street 30/4, Ward 1, Cao Lanh city, Dong Thap province
- Telephone: 0277.3851431 - 0277.3853112, Fax: 0277.3851615

3. LINKAGE BETWEEN THE SUBPROJECT AND OTHER PROJECTS, DEVELOPMENT PLANNING'S APPROVED BY COMPETENT STATE MANAGEMENT AGENCIES

3.1. VnSAT project

The Vietnam Sustainable Agricultural Transformation (VnSAT) with loan capital of WB, the total loan amount is USD 15.47 million, of which the counterpart fund from Dong Thap province is USD 2.37 million.

The overall goal of the VnSAT project is to contribute to the implementation of the agricultural sector restructuring plan through strengthening the institutional capacity of the

sector; Renovation of sustainable farming practices and enhancement of value chains for rice and coffee in two key commodity production areas of Vietnam, the Mekong Delta and the Central Highlands.

Objectives:

- Economic objective: For the rice component: With 200.000ha of rice production of 140,000 household (HH)s applying advanced technology, farmers' profit per hectare may increase by 30% equivalent to 40 - 60 million per year.
- Social objectives: Approximately 140,000 HHs in the Mekong Delta access to sustainable farming practices and linkages in the value chain from production to consumption with enterprises, cooperatives and farmers increase income by about 30%.
- Environmental objectives: Minimize negative impacts on the environment by reducing irrigated water, fertilizer and pesticide used in cultivation.
- Institutional capacity building: Institutional capacity building for agricultural restructuring in the MARD and project provinces.

Accordingly, this subproject will combine with the VnSAT project to support socio-economic development in the northern districts of Dong Thap, improve and renovate sustainable farming methods; to adapt to climate change; and improve the value chain of agricultural production for the subproject area.

3.2. Land use planning until 2020

The orientation of land use in Dong Thap province in general and subproject area including 4 districts/town: Hong Ngu Town, Hong Ngu, Tam Nong, and Thanh Binh districts are basically agricultural land. The main activities of the subproject are still for agricultural production development. However, there will be demonstration models combining agriculture, aquaculture, and fishery.

Thus, the investment in non-structural and structural works of this subproject does not change the land use planning and be in full compliance with the ability to apply the demonstration models of the subproject. The result is the basis for local authorities to alter land use for more effective exploitation of the construction system and high land-use efficiency thereof increase income.

3.3. Flood planning in Mekong Delta

The subproject area is still determined to maintain drainage capacity for MD including:

- Decision No. 144/1999/QĐ-TTg dated June 21, 1999 of the Prime Minister approving the master plan on Flood water control and usage in the MD from present to 2010. According to the plan, the dike covered by the proposed project site is the non-flood control area.
- Flood control planning and Water resources planning for the MD changed due to actual conditions, production needs and point of views on planning in each stage of socio-economic development in the region and overall MD.
- According to the project “Dyke planning in the MD” implemented by the Southern Institute of Water Resources Planning in 2006, the project area was designated as the August-flood control area.

- The Mekong Delta Master Plan (MDP 1.1) also identifies the upstream area as flood control combining two rice crops, one rice + cash crop and aquaculture or natural aquatic resource exploitation. The livelihood models based on floods; sediment obtained from flood retention and adaptive measures; only flood control measures in the upper delta areas related to “priority” measures and “no regrets” is implemented; Spatial planning for flood distribution/drainage canals should be placed in appropriate areas to avoid regret and the large cost of future flood protection.
- Up to the present time, regarding the planning and plans deployed throughout the MD, the subproject area is recommended to control flexibly only early floods (July - August).

As such, the location of the subproject perfectly works in line with the MD flood planning and at the same time enhances the flood drainage capability of the area thanks to dredging main canals such as Khang Chien and some others in subproject area.

3.4. Project of community-based freshwater resources conservation and management in Vietnam

The project will build on the successful work carried out under the WWF-HSBC global freshwater partnership to date. WWF-Vietnam is proposing a 2-year project (Jan 2018- Dec 2019), which will contribute to the goal: *Communities in key freshwater landscapes are engaged in freshwater conservation through education, citizen science and improved management, enhancing environmental, social and economic benefits.*

To achieve this goal, WWF-Vietnam, in collaboration with HSBC volunteers, will deliver on five main integrated objectives:

- To train HSBC volunteers on Sustainability Learning Module and local water/climate change issues
- To promote evidence-based conservation in freshwater conservation through citizen science
- To support sustainable livelihoods for local communities through freshwater conservation and ecotourism
- To support school-aged children to engage in issues around freshwater conservation through an environmental education program
- To strengthen capacity for local government partners in water conservation management and practices to ensure the project receive a high level of engagement and water conservation policy support from local authorities.

Wetland has functions of water storage and delay; sediment stabilization and phosphorus retention; nitrogen removal; thermoregulation; primary production; and habitat support for wildlife. Frequent monitoring and research activities within the project in TCNP are critical to maintaining these functions for wetland, ensuring the sustainability of wetland values.

Through development of the Community-based Ecotourism Service Partnership (CESP) in Tram Chim NP, providing platform, provision of training in ecotourism services, development of a benefit distribution mechanism which supports local communities and conservation outcomes in the wetland including habitat restoration, the project will bring into balance the desires for tourism development, community livelihoods and sustainable development within one of Vietnam’s most important wetland areas.

Through structured educational experiences and activities targeted to varying age groups and populations, conservation education enables people to realize how natural resources and ecosystems affect each other and how resources can be used wisely. With awareness raising activities in TCNP, people develop the critical thinking skills they need to understand the complexities of ecological problems and are encouraged to act on their own to conserve natural resources and use them in a responsible manner by making informed resource decisions.

In summary, through engagement in community education, citizen science and improved freshwater management, the project will have a genuine impact on the ground, both in terms of supporting local community engagement in key issues relating to freshwater conservation, but also in improving the value of environmental services within priority areas in Vietnam

3.5. Other related projects

There have currently a number of ongoing projects in the subproject area that addresses issues on management and mitigation of drought and flood risks as:

- Project of building embankment system to cope with climate change and protect people's lives in Tram Chim town, Tam Nong district, Dong Thap province.
- Project of construction of works to improve and upgrade the system of drainage canals for flood drainage and irrigation for the Plain of Reeds, Dong Thap province under the project of Greater Mekong sub-region flood and drought risk management and mitigation funded by ADB and AusAID.
- Project on upgrading infrastructure for agricultural development and climate change adaptation in Cu Lao Tay, Thanh Binh district, Dong Thap province.

This subproject and existing projects in the project area will contribute to the improvement of infrastructure for the development of livelihood models in the flood season, adaptation to climate change.

4. NATIONAL LAWS AND REGULATIONS AND WB SAFEGUARD POLICIES

4.1. Relevant National Laws and Regulations

4.1.1. National laws and regulations are applied for the subproject environmental and social assessment and environmental management

The following national laws and regulations are applied for the subproject environmental and social assessment and environmental management during the subproject preparation, construction, and operation:

- Law on Environmental Protection No. 55/2014/QH13 of the National Assembly of the Vietnam Socialist Republic of Vietnam dated June 23, 2014. This law enacted policies and regulations on environmental safeguards, and rights and obligations of organizations, households, and individuals related to environmental protection activities.
- Land law No. 45/2013/QH13 of the National Assembly of the Vietnam Socialist Republic of Vietnam dated November 29, 2013. This Law prescribes the regime of land ownership, powers and responsibilities of the State in representing the entire-people owner of the

land and uniformly managing land, the regime of land management and use, the rights and obligations of land users involving land in the territory of Vietnam.

- Law on water resources No. 17/2012/QH13 of the National Assembly of Vietnam dated June 21, 2012 provides on management, protection, exploitation and use of water resources, as well as the prevention of, combat against and overcoming of harmful effects caused by water in the territory of the Socialist Republic of Vietnam.
- Law on natural disaster prevention and control No. 33/2013/QH13 dated June 19, 2013 provides natural disaster prevention and control activities; rights and obligations of agencies, organizations, households and individuals engaged in natural disaster prevention and control activities; and the state management of, and assurance of resources for, natural disaster prevention and control.
- Law on Labor No.10/2012/QH13 of the National Assembly of the Vietnam Socialist Republic of Vietnam dated June 18, 2012 provides labor standards; rights, obligations and responsibilities of employees, employers, employees' representative organizations and employers' representative organizations in industrial relations and other relations directly related to industrial relations; and state management of labor.
- Law on amending and supplementing a number of articles of the law on cultural heritages No. 32/2009/QH12 of the National Assembly of Vietnam dated June 18, 2009 to amend and supplement a number of articles of the Law on Cultural Heritages.
- Law on biodiversity No. 20/2008/QH12 of the National Assembly of Vietnam dated November 13, 2008 provides for the conservation and sustainable development of biodiversity; rights and obligations of organizations, households and individuals in the conservation and sustainable development of biodiversity.
- Decree No. 45/2015 / ND-CP dated May 06, 2015 of the Government regulating the establishment and management of water protection corridors.
- Decree No. 38/2015/NĐ-CP of the Government dated 24 April 2015 on waste management including hazardous wastes, daily-life solid waste, ordinary industrial solid waste, liquid waste products, wastewater, industrial emissions and other particular wastes; environmental protection in discarded material imports.
- Decree No. 18/2015/ND-CP dated February 14, 2015 of the Government on environmental protection planning, strategic environmental assessment, environmental impact assessment, and environmental protection commitment.
- Decree No. 47/2014/ND-CP issued by the Government dated 15 May 2014 providing for compensation, support and resettlement when the State acquires land.
- Decree No. 43/2014/ND-CP of 15 May 2014 of the Government detailing the implementation of a number of articles of the Land Law.
- Decree No. 201/2013 / ND-CP of the Government dated 27 November 2013 detailing the implementation of some articles of the Law on Water Resources.
- Circular No. 19/2016/TT - BYT of 30 June 2016 of the Ministry of Health guiding labor hygiene, laborers' health and occupational diseases.
- Circular No. 36/2015/TT-BTNMT of 30 June 2015 of the Ministry of Natural Resources and Environment on hazardous waste management.

- Circular No. 27/2015/TT-BTNMT dated 19 May 2015 of the Ministry of Natural Resources and Environment on strategic environmental assessment, environmental impact assessment, and environmental protection plan.
- Circular No. 37/2014/TT-BTNMT dated June 30, 2014 of the Ministry of Natural Resources and Environment detailing compensation, support and resettlement upon land acquisition by the State.
- Circular No. 146/2007/TT-BQP of the Ministry of Defense dated 11 September 2007 guiding the implementation of Decision No. 96/2006 / QD-TTg of the Government dated May 04, 2006 on management and Carrying out demining activities.
- Circular 146/2007/TT-BQP by Ministry of Defense dated September 11 2007 guiding UXO clearance for project construction.

The following national technical regulations and standards related to environmental quality and waste management are applied to the subproject:

- QCVN 03-MT:2015/BTNMT: National technical regulation on the permitted limit of heavy metal on land
- QCVN 05:2013/BTNMT: National technical regulation on ambient air quality
- QCVN08-MT:2015/BTNMT: National technical regulation on water surface quality
- QCVN 09-MT:2015/BTNMT: National technical regulation on underground water quality
- QCVN 14:2008/BTNMT: National technical regulation on domestic wastewater.
- QCVN 15:2008/BTNMT: National technical regulation on the pesticide residues in the soils
- QCVN 19:2009/BTNMT: National technical regulation on industrial emission of inorganic substances and dust
- QCVN 20: 2009/BTNMT: National technical regulation on industrial emission of organic substances.
- QCVN 26:2010/BTNMT: National technical regulation on noise.
- QCVN 27:2010/BTNMT: National technical regulation on vibration.
- QCVN 40:2011/BTNMT: National technical regulation on industrial wastewater.
- QCVN 43:2012/BTNMT - National technical regulation on sediment quality in fresh water areas.

4.1.2. Legal documents, decisions and official letters of related authorities on the subproject

- Official Letter No. 5350/VPCP-QHQT dated 10 July 2015 of the Government Office on the project “Integrated Rural Development to Improve Adaptation to Climate Change in the Mekong Delta”, assign the Ministry of Agriculture and Rural Development (MARD) to implement the project.
- Aide Memoire of the mission (project identification, technical team) of the WB during the missions: from 26/11/2014 to 15/12/2014; from 03/02/2015 to 05/02/2015; 30/03/2015 to 15/04/2015; 15-18/06/2015 and 06-17/07/2015; 21/09/2015 to 02/10/2015

- Decision No. 882/QĐ-BNN-HTQT dated March 19, 2015 of the Minister of MARD on assigning to the Central Project Management Board for irrigation projects (CPO) as the project owner in the preparation phase of investment of the Integrated Rural Development to Improve Adaptability to Climate Change in the Mekong Delta project (now known as the ICRSL project).
- Official Letter No. 151/BNN-HTQT dated 29/02/2016 of the Ministry of Agriculture and Rural Development on the preparation for approval of the feasibility study report of the ICRSL project.
- Decision No. 736/QĐ-TTg dated 29/4/2016 of the Prime Minister approving the list of the project “Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods” for WB loans.
- Decision No.1262/QĐ-BNN-KHCN dated 12/4/2016 of the Ministry of Agriculture and Rural Development approving the Environmental and Social Management Framework (ESMF) of the ICRSL project.
- Decision No. 1693/QĐ-BNN-HTQT dated 09/5/2016 of the Ministry of Agriculture and Rural Development on approving the Feasibility Study Report of the project “Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods (ICRSL)” funded by WB.

4.1.3. Documents and data of the subproject owner to be used in the process of environmental impact assessment

- Report on the feasibility study of subproject: *Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province), prepared in 2017.*
- The analysis results of the baseline environmental data in the subproject area conducted by the Southern Institute of Water Resources Research in July 2017.
- The results of the public consultations on the subproject in November 2017.

4.2. Applicable WB Safeguard Policies

The environmental and social screening for the subproject according to the criteria described in the Bank’s policy on environmental assessment has been carried out, and the result shows that the WB policies on Environmental Assessment (OP/BP 4.01)¹, Natural Habitats (OP/BP 4.04)², Physical cultural resources (OP/BP 4.11)³, Forests (OP/BP 4.36)⁴, and Involuntary

¹Full treatment of OP/BP 4.01 can be found at the Bank website:

<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEOL/0,,contentMDK:20543912~menuPK:1286357~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>

² Full treatment of OP/BP 4.04 can be found at the Bank website:

<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEOL/0,,contentMDK:20543920~menuPK:1286576~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>

³Full treatment of OP/BP 4.11 is accessible at

<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEOL/0,,contentMDK:20543961~menuPK:1286639~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>

⁴ Full treatment of OP/BP 4.36 can be found at the Bank website:

<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEOL/0,,contentMDK:20543943~menuPK:1286597~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>

Resettlement (OP/BP 4.12)⁵ are applied to this subproject (*Table 0.1*). The subproject also has to comply with the World Bank's requirements on public consultation and Policy on Access to Information are triggered for this subproject.

Dong Thap has a very small population of ethnic minorities in the subproject area. The ethnic Khmer, Cham, and Hoa have largely inter-married with Kinh and are largely integrated into the wider land holding Kinh communities. There are no segregated ethnic communities or villages in the area. The method for production of these ethnic minorities is similar to that of the Kinh people.

The subproject has also to comply with the WB's requirements on public consultation and Policy on Access to Information. The implementation of the policy on OP/BP 4.12 is addressed in the Resettlement Policy Framework (RPF) of the MD-ICRSL project, and the Resettlement Action Plan (RAP) of this subproject.

Table 0.1: Application of the WB's safeguard policies to this subproject

<i>Policy</i>	<i>Triggered (Yes/No)</i>	<i>Explanation/Actions</i>
Environmental Assessment (OP/BP 4.01)	Yes	The environmental and social screening result confirmed that the proposed subproject is classified as Category B because its potentially adverse environmental and social impacts are site-specific, few if any of them are reversible, and in most cases, mitigatory measures can be designed more readily. However, ESIA was prepared to describe the potential negative impacts and the proposed mitigation measures to be implemented under the subproject including annexes providing information on public consultation, and ECOP to be applied during construction. The ESIA is consistent with the EIA report prepared according to the GOV's EIA regulations including consultation with the local authority and the local community. The EIA report will be submitted to the agency (Dong Thap DONRE) for approval.
Natural Habitats (OP/BP 4.04)	Yes	The subproject area does not have sensitive natural habitats as the WB's guidelines but normal natural habitats that have been largely reclaimed for a long period of time. Possible impacts on water quality and ecology during the construction and operation phases will be monitored as part of the ESIA.
Forest (OP/BP 4.37)	Yes	There have no impacts on the forest during the subproject implementation
Pest Management (OP 4.09)	Yes	The subproject has initiated the pest management policy which has been agreed by local authorities in the subproject area.
Indigenous Peoples (OP/BP 4.10)	No	The screening result in the subproject communes on the ethnic minority showed that there have very few ethnic Khmer, Cham and Hoa people in the subproject area but all of them have inter-married with Kinh and are largely integrated into the wider land holding Kinh communities. There are no segregated

⁵Detailed description of OP/BP 4.12 is available at the Bank website:
<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEPOL/0,,contentMDK:20543978~menuPK:1286647~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>

<i>Policy</i>	<i>Triggered (Yes/No)</i>	<i>Explanation/Actions</i>
		ethnic communities or villages in the area. The method for production of these ethnic minorities is similar to that of the Kinh people.
Physical cultural resources (OP/BP 4.11)	Yes	There are no historical, cultural, spiritual and archaeological sites of interest at all levels (local, provincial, national as well as international) within the scope of the subproject land acquisition. Sensitive areas within the radius of 10 km of the construction sites are not intangible cultural assets at provincial, national as well as the international level (except Tram Chim National Park). A chance finds the procedure for the subproject is developed in Chapter 5.
Involuntary Resettlement (OP/BP 4.12)	Yes	The subproject acquires land for construction. Avoidance of resettlement was the main reason for the selection of the subproject sites. In addition, the subproject owner has also prepared a resettlement action plan to deal with the impacts of land acquisition for the subproject.
Dam safety (OP/BP 4.37)	Yes	The subproject does not build dams

World Bank Group Environmental, Health, and Safety Guidelines

World Bank-financed projects should also take into account the World Bank Group Environmental, Health, and Safety Guidelines⁶ (known as the "EHS Guidelines"). The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice.

The EHS Guidelines contain the performance levels and measures that are normally acceptable to the World Bank Group and are generally considered to be achievable in new facilities at reasonable costs by existing technology. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to the World Bank, become project- or site-specific requirements. This subproject should conform to the general EHS Guidelines and industry specific EHS Guidelines on Aquaculture.

5. ORGANIZATION OF THE ESIA REPORT

The Southern Institute for Water Resources Research (SIWRR) has been selected by the subproject owner to prepare an ESIA report for this subproject, due to its legal status and experience.

Information about the consultant:

Southern Institute of Water Resources Research

Represented by: Mr. Tran Ba Hoang - Position: Director

Address: 658 Vo Van Kiet, Ward 1, District 5, Ho Chi Minh City

Contact phone: (028) 39233700 - Fax: (028) 39235028

SIWRR was established in 1978 under the Decision No. 864 QD/TC dated 19 August 1978 of the Ministry of Water Resources (now the Ministry of Agriculture and Rural Development).

⁶The EHS Guidelines can be consulted at www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.

Over 37 years of operation, development, and growth, the Institute's activities are always parallel to the cause of agriculture and rural development, management and rational use of water resources, natural disaster mitigation, and land rehabilitation, environmental protection ... in the southern provinces, especially in the Mekong Delta.

In terms of material facilities, the Institute has three specialized laboratories licensed by the Ministry of Construction including Environmental Chemistry Laboratory (LAS-1037) VIMCERTS 200, Laboratory of Foundation and Geotechnical Research (LAS-155), Building Materials and Structure Research Laboratory (LAS-143).

The Institute has been accredited with ISO 9001-2008, in addition to recognized laboratories in the accreditation system. In terms of machines and equipment: In addition to conventional machines, the Institute's units are also equipped with much-advanced research equipment such as wind meter - Distomat wind meter; Echo-sounding meter, sediment measuring equipment for different environments, gas chromatography, atomic absorption (UHCM), carbon monoxide detector, total N, UV-Vis colorimeter, DO measuring instrument, pH, EC, salinity, opacity, noise, etc.... Software support: ArcGIS, remote sensing software, MIKE, HYDROGIS, DUFLOW, KOD, SAL, VRSAP, IMSOP, SOIL, SOICHEM.

In order to carry out this report, the subproject owner and consultant has nominated a team of qualified and experienced professionals in both environment and English. Details of participants in the report are presented in *Table 0.2*.

Table 0.2: List of people directly involved in the preparation of the ESIA report

No.	Full name	Background	Assigned tasks	Signature
I	Subproject owner– Dong Thap DARD			
1	Vo Thanh Ngoan	Water resources	- Managing and directing the implementation of the report	
2	Huynh Van Hieu	Water resources	- Provide information about the subproject - Coordinate with consultants to work with local departments	
II	Consultant - Southern Institute of Water Resources Research			
1	Vu Nguyen Hoang Giang	Environment and Social Science	- General management - Work with related organization to capture the real situation of production and daily activities in the subproject area. - Contact authorities for public consultation - Consultation with the community - Be responsible for issues related to climate change - Complete the report - Lead the field review committee - Defense the report before the appraisal committee - Revise the report according to the opinion of the appraisal committee of Viet Nam and WB	
2	Nguyen Van Khanh Triet	Water resources	- Participate in gathering documents and data to develop contents on water resources - Responsible for hydrological flow and	

No.	Full name	Background	Assigned tasks	Signature
			water resources	
3	Duong Cong Phieu	Water Works	<ul style="list-style-type: none"> - Participate in gathering documents and data to develop contents on water works - Responsible for issues related to water works and water navigation and transportation 	
4	Duong Cong Chinh	Biology	<ul style="list-style-type: none"> - Participate in gathering documents and data to develop contents on biology - Public consultation - Responsible for issues related to biology and biodiversity 	
5	Dong Thi An Thuy	Analytical chemistry	<ul style="list-style-type: none"> - Participate in gathering documents and data to develop contents on chemistry - Responsible for taking and analyzing samples and issues related to fertilizer and pesticides. 	
6	Nguyen Kim Duyet	Environment, Mapping and GIS	<ul style="list-style-type: none"> - Field survey, collection and synthesis of document and data - Responsible for water quality issues, develop maps for ESIA report 	
7	Pham Thi Thuy Van	Culture	<ul style="list-style-type: none"> - Field survey, collection and synthesis of document and data - Develop a map of the relationship between subproject and natural and socio-economic subjects - Responsible for issues of cultural resources, cultural and social impacts 	
8	Nguyen Quang Vinh	Water Resources	<ul style="list-style-type: none"> - Field survey, collection and synthesis of document and data - Develop maps for the overall layout of the subproject and subproject items - In charge of the natural and socio-economic conditions of the subproject. 	
9	Mai Thanh Trinh	Institutions and policy	<ul style="list-style-type: none"> - Field survey, collection and synthesis of document and data - Be responsible for the institutional and policy issues 	
10	Huynh Dang Ngoc Lan	Environment	<ul style="list-style-type: none"> - Field survey, collection and synthesis of document and data - Responsible for issues related to the air environment, monitoring program and environmental management 	
11	Pham Chi Trung	Social Science	<ul style="list-style-type: none"> - In charge of socio-economic surveys of households affected by the subproject. - Assess the impact of the subproject on socio-economic development of the area 	

6. METHODOLOGIES AND APPROACHES FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

6.1. Methods of ESIA

6.1.1. Rapid assessment method

The Rapid Assessment Method was issued by the World Health Organization (WHO) in 1993. Basis of this method is the nature of materials, technologies, and rules of natural processes as well as experiences in rating pollution load.

In Vietnam, this method is introduced and applied in many ESIA studies, performing the relatively accurate calculation of the pollution load in the context of limited measurement and analysis instruments. In this report, the pollution load coefficients are taken under the EIA guidelines of the World Bank (Environmental Assessment Sourcebook, Volume II, Sectoral Guidelines, Environment, World Bank, Washington D.C 8/1991) and Handbook of Emission, Non-Industrial and Industrial source, Netherlands) and this is used in Chapter 3 of the report for rating pollution load due to implementing the subproject's activities.

6.1.2. Impact identification method

This method is applied through the following specific steps: describe the environment system; identify the subproject components that affect the environment; and identify the full range of related waste streams, environmental issues to serve the detailed evaluation. This method is applied for Chapter 3 of the report.

6.1.3. Mapping method

This method is applied to assess spatial intervention of the subproject, in addition to the specific activities that cause impact and scope of influence can also use this method based on the results of the assessment of the impact of the subproject. This method is applied for Chapters 1 and 3 of the report to show the subproject interventions, subproject's location and location of sampling sites.

6.1.4. Impact matrix method

Building a correlation between the effects of each project activity to each issue and environmental composition as shown in the impact matrix. On such basis, to orientate detailed contents to be studied with impacts. In this report, this method is used for Chapter 3.

Matrix and its variants provide us a framework of the interaction of different actions /activities of a project with potential environmental impacts caused by them. In this report, a simple interaction matrix is formed where the subproject actions are listed along one axis vertically and EI are listed along the other side horizontally (Chapter 3).

6.1.5. Household survey

Household (HH) survey was conducted after the completion of the review of secondary data and field observations. Prior to field work, a household questionnaire was developed to guide the collection of additional data (see details in Appendix 2). Questionnaires developed include

(i) guide questions (for focus group discussion and community consultation); (ii) household survey (for interview selected households).

100% directly AHs due to land acquisition, 14/14 CPCs and 20% HHs in the beneficiary area of the subproject were surveyed for socio-economic conditions, their interest on the land compensation policy and livelihood models proposed in the subproject. The results of the survey will be a basis for assessing environmental impacts and proposing mitigation measures for the subproject.

6.1.6. Focus group discussion and community consultation

In addition to the above inquiry techniques, consultation sessions were carried out by in the form of focus groups discussion, and community meetings to confirm the findings of field observation as well as household interviews. Five consultation meetings with 240 participants on the content of ESIA report and receiving comments of participants and 4 meetings with 4 subproject districts/town for choosing livelihood models. Details of the consultation and the feedback from the consultations will be included in the ESIA report and the design of the subproject (Chapter 7).

6.2. Other methods

6.2.1. Method of information and data inheritance, summary and analysis

This method is to identify and assess natural conditions and socio-economic conditions of the subproject area through data and information collected from various sources such as the statistic yearbooks, regional socio-economic profile reports, and regional baseline environmental and relevant studies. At the same time, the inheritance of the available studies and reports is really essential to use up available findings and further identify limitations. In this report, data, information on the subproject information and socio-economic conditions in the subproject area are collected for relevant sources (Chapter 1-3).

6.2.2. Review of secondary data

Review of secondary data included a review of existing literature related to the subproject area and review of information available from the subproject documents. Of particular importance is the review of data/information available in the Feasibility Study of the subproject (prepared by SIWRR), and other relevant information, and statistics.

6.2.3. Field survey method

Field survey is compulsory for ESIA/EIA to identify the status of the subproject area, relevant surrounding sensitive receptors to select sampling positions, the survey of status of natural environment, hydrography, weather conditions, land use, vegetation cover, fauna and flora in the subproject area. These survey results will be used for assessment of natural conditions of the subproject area and used for Chapter 2 of the report.

6.2.4. Field observation

For the social assessment, field observation was a good source of information that helps verify the initial results obtained from the secondary data review. Field observations aimed at

collecting and complementing the information already available to contribute to the design of the household survey and guide questions (for group discussion).

6.2.5. Comparison method

The method is to assess environmental quality, effluent quality, pollution load, etc. On the basis of comparison with the concerning environment norms and standards, the regulations of the Ministry of Health and Ministry of Natural Resources and Environment as well as the related researches and experiments in Chapter 3 of the report.

6.2.6. Consensus method

Based on knowledge and experiences in environmental science of ESIA, the specialists of the consultant team and other scientific research units within SIWRR will discuss and agree the findings of the ESIA.

6.2.7. Sampling and analyzing methods in laboratory

Sampling and analyzing samples of environmental components (soil, water, air) are integral to identify and evaluate the status of baseline environment quality in the subproject area as follows:

- Surface and underground water quality: samples were taken and analyzed, complying with the Vietnam standards, and results compared with National Technical Regulation on Surface Water Quality (QCVN 08-MT:2015/BTNMT) and National Technical Regulation on Underground Water Quality (QCVN 09/2008/BTNMT).
- Ambient air quality: samples were taken and analyzed, complying with the Vietnam standards, and results compared to QCVN 05:2013/BTNMT– National Technical Regulation on ambient air quality.
- Noise and vibration: samples were taken and analyzed, complying with the Vietnam standards, and the results compared to QCVN 26:2010/BTNMT- National technical regulation on noise and QCVN 27:2010/BTNMT- National technical regulation on vibration.

CHAPTER 1. SUBPROJECT DESCRIPTION

This chapter concisely describes the proposed project and its geographic, ecological, social, and temporal context, including any offsite investments that may be required (e.g., dedicated access roads, water supply, housing, and raw material and product storage facilities, land acquisition, implementation schedule and investment fund, etc.)

1.1. SUBPROJECT NAME AND OWNER

Subproject name: Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)

Belonging to the project: Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods (ICRSL).

1.2. SUBPROJECT OWNER

- Subproject owner: Dong Thap Department of Agriculture and Rural Development.
 - Address: Highway 30, My Tan Commune, Cao Lanh City, Dong Thap Province
 - Phone: (0277) 3851427, Fax: (0277) 3853514
 - Email: bbtstnptnt@dongthap.gov.vn
 - Legal representative: Mr. Nguyen Van Cong - Director
- Representative of the subproject owner: Management Board of Dong Thap ICRSL.
 - Address: 533, Highway 30, My Tan Commune, Cao Lanh, Dong Thap
 - Tel: (0277) 3852.144; Fax: (0277) 3859.544
 - Legal representative: Mr. Vo Thanh Ngoan - Director

1.3. SUBPROJECT LOCATION

The subproject is established in 4 districts including Hong Ngu district, Hong Ngu town, Tam Nong district and Thanh Binh district, Dong Thap province.

The demarcation of the subproject area is as follows: (i) the north borders Cambodia; (ii) the south is An Phong-My Hoa canal; (iii) the west is bordered by Canal No. 2 Tu Thuong and Hai Thang Chin canals; (iv) the east is Thong Nhat canal (see *Figure 1.1*).

Figure 1.1: Location of the subproject

1.4. THE SCOPE OF SUB-PROJECT

1.4.1. Subproject objectives and tasks

1.4.1.1. Objectives

- To create a flood retention area in the upper Plain of Reeds to avoid flood changes and affect other areas.
- To create favor conditions for production and selection of livelihoods in flood season, actively adapt to climate change, sea level rise, subsidence and drought, so that people in the project area increase their income; ensure stability and social security in flood season, avoid increasing the rate of poor or re-poor households.
- To enhance the added value of local production and diversify agricultural products in flood season.

1.4.1.2. Tasks

- Reviewing the current status of production and livelihood models accordance with the natural conditions and educational level in the direction of utilizing flood benefits, minimizing damages caused by flood, creating jobs and increasing income during flood season.

- Reviewing and assessing the current status of infrastructure in the project area for the upgradation and improvement of the technical infrastructure (canal dredging, dike strengthening, construction of sluices, culverts, pumping stations, breeding nets, etc.) to ensure the production of livelihood models in flood season and to adapt to climate change.
- Investing in upgrading semi-dike system to avoid dike break and create convenient transport infrastructure; ensure stable 2-rice crops (Winter-Spring, Summer-Autumn) in flood season.
- Connecting with other funded projects in the region (programs of new rural area development, small and medium electric pump stations, agricultural restructuring; VnSAT project, and others) to ensure “no regret” investment.

1.4.2. Structural works

In order to meet the above objectives, the proposed structural works will be carried out in the subproject including canal dredging, embankment and spillway lining/strengthening and rehabilitation or construction of sluices and pumping station, see *Table 1.1* to *Table 1.5*.

Table 1.1: Summary of dredged canals dimension

No.	Items	Section length (m)	Width of canal bottom (m)	Elevation of canal bottom (m)	Roof coefficient
I	Hong Ngu town	15,502			
1	Khang Chien Canal (from Tan Thanh-Lo Gach Canal to Hong Ngu-Tam Nong Canal)	9,300			
	Section from K0+000 to K4+100	4,100	4	-3	1.5
	Section from K4+100 to K4+752	652	8	-3	1.5
	Section from K4+752 to K6+300	1,548	8	-3	1.5
	Section from K6+300 to K9+300	3,000	8	-3	1.5
2	Khang Chien 1 Canal	2,652	8	-3	1.5
3	Hong Ngu-Tam Nong Canal (section from Canal 2/9 to Khang Chien Canal)	3,550	4	-3	1.5
II	Tam Nong District	11,700			
1	Khang Chien Canal (from border canal of Hong Ngu-Tam Nong to border canal of Thanh Binh-Tam Nong)	11,700	8	-3	2
III	Thanh Binh District	10,042			
1	Khang Chien Canal (from border canal of Thanh Binh-Tam Nong to An Phong-My Hoa Canal)	2,388	8	-3	1.5
2	Border canal of Thanh Binh-Tam Nong (from Khang Chien Canal to Thong Nhat Canal)	4,476	4,5	-3	1.5
3	Ca Cai Canal (from Khang Chien Canal to Hai Thang Chin canal)	3,178	5	-3	1.5
Total		37,244			

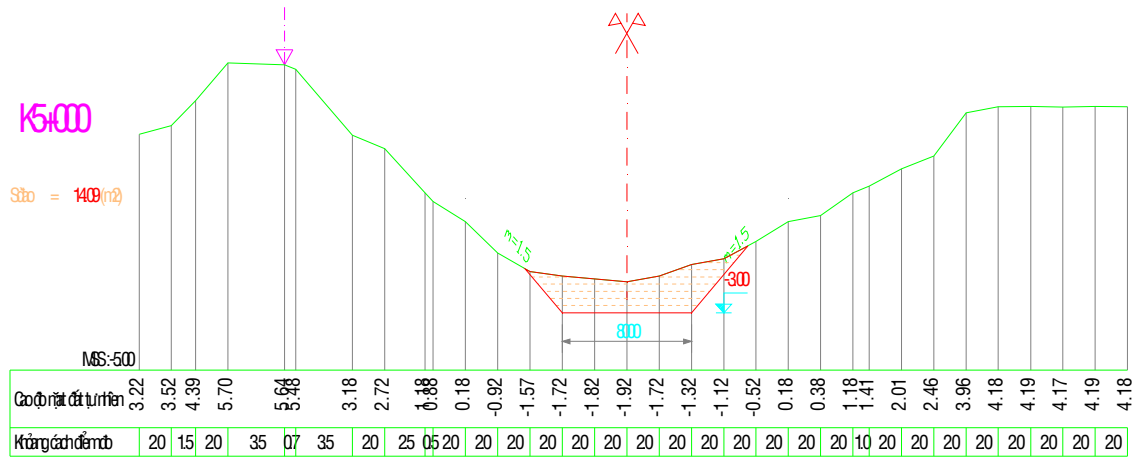


Figure 1.2: Typical cross section of Khang Chien canal dredging by blowing dredger

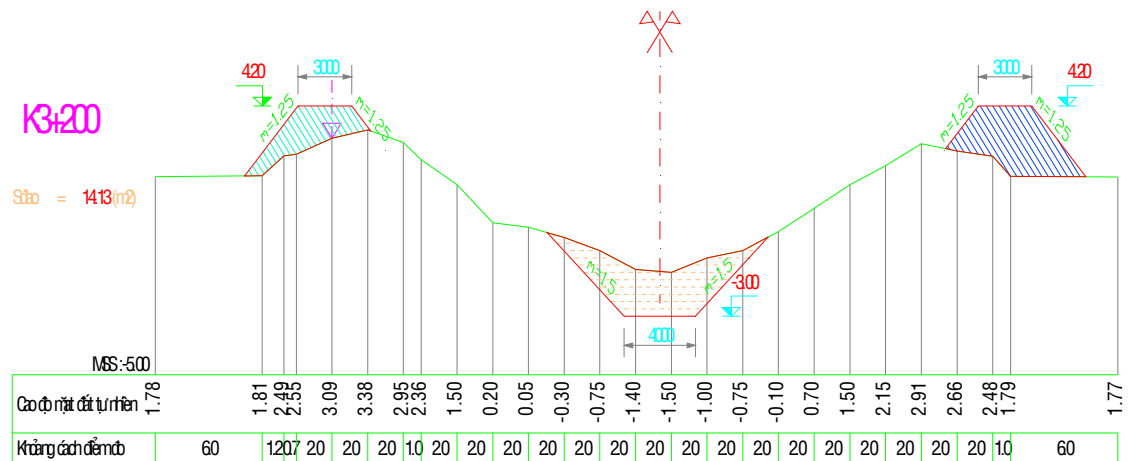


Figure 1.3: Typical dredging cross section by backhoe dredger

Table 1.2: Design parameters of culverts and pump stations

No .	Item	Area	Irrigation	Drainage	Pump station Dimension	Culvert dimension			Embankment dimension		Medium-Voltage line 3P-22KV (m)
					L x W x H	Aperture	Length	Bottom elevation	Elevation	Width	
		(ha)	(m ³ /h)	(m ³ /h)	(m)	(m)	(m)	(m)	(m)	(m)	
I	Hong Ngu District										
1	Nam Mung sluice	178.33	892	9,052		2.5x2.5	24.81	-0.5	6.3	5.5	
2	Cay Dua sluice	178.33	892	9,052		3.5	26.2	-1	5.3	5	
3	Repair of Dau Ca Cat sluice + Pump Station	178.33	892	9,052	10x7	2.5x2.5	23.91	-0.5	6	5.5	Existing
4	Hau Ca Cat Sluice + Pump Station	267.50	1,339	13,578	14.5x16.2	3.5	10	-1	5.3	5	Existing
5	Sau Quang Sluice + Pump Station	185.00	926	9,391	14.5x16.2	3.5	10	-1	5.3	5	500
6	Hau Muong Vop sluice + Pump Station	190.00	951	9,644	14.5x16.2	3.5	10	-1	5.3	5	80
7	Hau Bao Goc sluice + Pump Station	248.30	1,243	12,605	14.5x16.2	3.5	10	-1	5,3	5	80
II	Hong Ngu town										
1	Ong On Sluice (irrigation) + Pump Station (K1-Tan Hoi)	137.0	686	6,954	10x7	2x1.5x1.5	22.11	-0.5	5	5.5	900
2	Bay Muoi Hai Sluice + Pump Station (K2-An Binh B)	270.0	1,351	13,705	14.5x16.2	3.5	10	-1	5.3	5	820
3	Ong Nhon Sluice + Pump Station (K2-An Binh B)	270.0	1,351	13,705	14.5x16.2	3.5	10	-1	5.3	5	300

No .	Item	Area	Irrigation	Drainage	Pump station Dimension	Culvert dimension			Embankment dimension		Medium-Voltage line 3P-22KV (m)
					L x W x H	Aperture	Length	Bottom elevation	Elevation	Width	
		(ha)	(m ³ /h)	(m ³ /h)	(m)	(m)	(m)	(m)	(m)	(m)	
4	Hai Xang sluice (K1-Tan Hoi)	137.0	686	6,954		5x3.5	28.81	-0.5	5	5.5	
5	Dia Sinh Sluice (K3-Binh Thanh)	210.0	1,051	10,660		3.5x6.3	26.2	-1	5.3	5	
6	Tau Cuoc Sewer (K3-An Binh A)-(combined irrigation and drainage)	460.0	2,302	23,350		2.5x2.5	20.6	-0.5	4.5	5.5	
7	Kho Be Sewer (K3-An Binh A)-(irrigation)	188.0	941	9,543		2.5x2.5	31.12	-2	5	5.5	
III	Tam Nong district										
1	Sluice+ Pump Station of West bank of Phu Thanh 3 Canal (Thong Nhat) (Compartment No.13)-(combined irrigation and drainage)	598.0	2,992	30,354	10x7	2.5x2.5	20	-0.5	4	5.5	10
2	Sluice + Pump Station of West bank of Khang Chien Canal (Cu Lao Chim)-(irrigation)	120.0	600	6,091	10x7	2.5x2.5	20	-0.5	4	5.5	200
3	Sluice + Pump Station of West bank of An Long 2 Canal (compartment No.5 Phu Ninh)-(drainage)	412.0	2,062	20,913	10x7	2.5x2.5	20	-0.5	4	5.5	60

No .	Item	Area	Irrigation	Drainage	Pump station Dimension	Culvert dimension			Embankment dimension		Medium-Voltage line 3P-22KV (m)
					L x W x H	Aperture	Length	Bottom elevation	Elevation	Width	
		(ha)	(m ³ /h)	(m ³ /h)	(m)	(m)	(m)	(m)	(m)	(m)	
4	Sluice + Pump Station of North bank of Dong Tien Canal (Compartment No.14)- (combined irrigation and drainage)	290.5	1,454	14,746	10x7	2.5x2.5	20	-0.5	4	5.5	1300
5	Sluice + Pump Station of North bank of Dong Tien Canal (compartment No.15), combined irrigation and drainage	398.7	1,995	20,236	10x7	2.5x2.5	20	-0.5	4	5.5	150
6	Sluice + Pump Station of West bank of An Long 2 Canal (compartment No.5 An Long), drainage	412.0	2,062	20,913	10x7	2.5x2.5	20	-0.5	4	5.5	60
IV	Thanh Binh District										
1	Ca Gao Sluice (border the An Phong-My Hoa Canal)	366.5	3,668	37,207	-	5	27	-2	4	6	50
2	Ca Gao Sluice (border the Duong Gao Canal)	366.5	3,668	37,207	-	5	27	-2	4	6	50

Table 1.3: Dimension of electric pumping stations

No.	Item	Design- ned area	Flow for		Pump station					Sluice			Embankment		Medium- Voltage line 3P-22KV (m)
			Irrigat ion	Drain- age	LxB xH	Elev- ation for pump place- ment	Flow	Water Head	No. of pumps	Aper- ture	Leng- th	Bot- tom eleva- tion	Bot- tom eleva- tion	Top eleva- tion	
		(ha)	(m3/h)	(m3/h)	(m)	(m)	(m3/h)	(m)	(pump)	(m)	(m)	(m)	(m)	(m)	(m)
I	Hong Ngu District														
1	Muong Vop Station	95	475.4	4.822	10x6x5	4.50	1,500	5	2	1.5x2.5	23.91	-0.5	6	5.5	Existing
2	Chin Hue Station	178	892.4	9.052	10x6x5	4.50	1,500	5	3	1.5x2.5	23.91	-0.5	6	5.5	Existing
3	Roc Nga Tu Station	252	1.259.3	12.775	10x6x5	4.50	1,500	5	3	1.5x2.5	19.75	-0.5	4.5	5.5	70
4	Don Ganh Station	126	630	6.387	10x6x5	4.50	1,500	5	3	1.5x2.5	19.75	-0.5	4.5	5.5	750
5	Repair of Bay Den Station	126	630	12.775	10x6x5	4.50	1,500	5	3	1.5x2.5	19.75	-0.5	4.5	5.5	2,000
6	Bay Ngoi Station	126	630	6.387	10x7x5	4.50	1,500	5	3	2.5x2.5	19.75	-0.5	4.5	5.5	Existing
7	Bay Xe Station	268	1.338.6	13.578	10x7x5	4.50	1,500	5	3	2.5x2.5	19.75	-0.5	4.5	5.5	900
8	Hai Thuoc Station	248	1.242.7	12.605	10x6x5	4.50	1,500	5	3	1.5x2.5	19.75	-0.5	4.5	5.5	1,500
9	Coi Dai Station	178	892.4	9.052	10x6x5	4.50	1,500	5	3	1.5x2.5	19.75	-0.5	4.5	5.5	1,500
10	Xeo Chon Station	123	613.0	6.218	10x6x5	4.50	1,500	5	2	1.5x2.5	19.75	-0.5	4.5	5.5	1,000
11	Ba Tuong Station	185	925.7	9.391	10x6x5	4.50	1,500	5	3	1.5x2.5	23.91	-0.5	5	5.5	100
II	Hong Ngu town														
1	Kenh Cut Station (K10, Binh Thanh)	200	1.000.8	10.152	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	19.75	-0.5	4.1	5.5	150

No.	Item	Design- ned area	Flow for		Pump station					Sluice			Embankment		Medium- Voltage line 3P-22KV (m)
			Irriga- tion	Drain- age	LxB xH	Elev- ation for pump place- ment	Flow	Water Head	No. of pumps	Aper- ture	Leng- th	Bot- tom eleva- tion	Bot- tom eleva- tion	Top eleva- tion	
			(ha)	(m3/h)	(m3/h)	(m)	(m)	(m3/h)	(m)	(pump)	(m)	(m)	(m)	(m)	(m)
2	Ong Toi Station (K1, Tan Hoi)	137	685.5	6.954	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	23.91	-0.5	4.8	5.5	1,800
3	Bau Chua (K9, Binh Thanh)	195	975.8	9.898	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	19.75	-0.5	4.1	5.5	1,000
4	Ca Ro+Sam Sai Station (K8, Binh Thanh)	188	938.3	9.518	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	19.75	-0.5	4.1	5.5	40
5	Ong Chieu Station (K3, Binh Thanh)	140	700.6	7.106	10x6x4.6	4.10	1,500	4.6	2	1.5x2.5	19.75	-0.5	4.1	5.5	130
6	Bay Thuoc Station (K2, Binh Thanh)	180	900.7	9.137	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	19.75	-0.5	4.1	5.5	1,000
7	Ut Le Station (K2, An Binh A)	211	1.057.1	10.723	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	19.75	-0.5	4.1	5.5	250
8	Nam Trieu Station (K2, An Binh A)	211	1.057.1	10.723	10x6x4.6	4.10	1,500	4.6	3	1.5x2.5	19.75	-0.5	4.1	5.5	1,100
III	Tam Nong District														
1	West bank Station of An Long 2 Canal	412	2.061.6	20.913	10x6x4.6	4.10	1,500	4.3	3	1.5x2.5	19.75	-0.5	4.1	5.5	500

No.	Item	Design- ned area	Flow for		Pump station					Sluice			Embankment		Medium- Voltage line 3P-22KV (m)
			Irrigat ion	Drain- age	LxB xH	Elev- ation for pump place- ment	Flow	Water Head	No. of pumps	Aper- ture	Leng- th	Bot- tom eleva- tion	Bot- tom eleva- tion	Top eleva- tion	
			(ha)	(m3/h)	(m3/h)	(m)	(m)	(m3/h)	(m)	(pump)	(m)	(m)	(m)	(m)	(m)
	(compartment No.5 An Hoa)														
IV	Thanh Binh district														
1	Ho Dau Station (East bank corner of Duong Gao canal-Khang Chien canal)	184	919.5	9.327	10x6x4.1	3.60	1,500	4.1	3	1.5x2.5	19.75	-0.5	3.6	5.5	50

Table 1.4: Dimension of reinforcing the head of drainage canals in Hong Ngu town

No.	Items	Dimension			Structure	Note
		Length (m)	Width (m)	Top elevation (m)		
I	Hong Ngu town					
1	Head of Thong Nhat canal bordered with So Ha river (west bank)	200.00	4.00	+3.80	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 2 talus
2	Head of Khang Chien canal bordered with Tan Thanh – Lo Gach canal (2 banks)	400.00	4.00	+3.80	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 2 talus
3	Head of Binh Thanh 2 canal bordered with Tan Thanh – Lo Gach (2 banks)	400.00	4.00	+3.80	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 2 talus
4	Head of Thong Nhat canal bordered with Tan Thanh – Lo Gach canal (West bank)	200.00	4.00	+3.80	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 2 talus
5	Head of Hai Thang Chin canal bordered with Hong Ngu – Vinh Hung canal (east bank)	200.00	4.00	+5.00	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 1 talus
6	Head of Khang Chien canal bordered with Hong Ngu – Vinh Hung canal (east bank)	200.00	4.00	+5.00	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 1 talus
7	Head of An Binh canal (Ba Anh bridge) bordered with Hong Ngu – Vinh Hung canal (east bank)	200.00	4.00	+3.80	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Surface and 2 talus
II	Hong Ngu district					
8	Head of Ca Sach canal bordered with So Thuong river (2 banks)	160.00	4.00	As existing	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Reinforcing surface and 2 talus
9	Head of Coi Tieu canal bordered with So Thuong river (2 banks)	160.00	4.00	As existing	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Reinforcing surface and 2 talus
10	Head of Coi Dai canal bordered with So Thuong river (2 banks)	160.00	4.00	As existing	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Reinforcing surface and 2 talus

No.	Items	Dimension			Structure	Note
		Length (m)	Width (m)	Top elevation (m)		
11	Head of Ca Cat sluice and pump station (2 banks)	80.00	4.00	As existing	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Reinforcing surface and 2 talus
12	Head of Nam Mung sluice (2 banks)	80.00	4.00	As existing	Reinforced concrete surface: 12 cm thick, reinforcing talus: 8 cm thick	Reinforcing surface and 2 talus
Total		2,440				

Table 1.5: Dimension of strengthening semi-dykes

No.	Item	Dimension (m)					Structure	Note
		Length	Foundation	Surface	Elevation	Section		
I	Hong Ngu district	12,980						
1	Suon 2 canal: East bank route; top surface, canal side slope; field side slope in weak places	5,550	5.00	3.50	+5.00	From K0+000	Reinforced concrete surface: 12 cm thick, Neoweb talus	Surface and canal-side talus of all route
2	North bank of Tu Thuong canal (from Suon 2 canal to Dia Cat canal), road surface and 2 talus	2,130	5.00	3.50	+5.00	From K0+000	Reinforced concrete surface: 12 cm thick, Neoweb talus	Surface and canal-side talus of all route
3	West bank of Dia Cat canal, road surface and 2 talus	4,000	5.00	3.50	+5.00	From K0+000 to K4+00	Reinforced concrete surface: 12 cm thick, Neoweb talus	Surface and canal-side talus of all route
4	North bank of Tu Thuong canal (from the conjunction of Cay Da canal to So Thuong bridge), road	1,300	5.00	3.50	+5.00	From K9+640 to K10+940	Reinforced concrete surface: 12 cm thick	Surface

No.	Item	Dimension (m)					Structure	Note
		Length	Foundation	Surface	Elevation	Section		
	surface							
II	Hong Ngu town	10,494						
1	South bank dike of Muong Lon canal (K3 zone, An Binh A, the section from Hai Thang Chin canal to Kho Be residential area) and the field-side talus	3,350	5.00	3.50	+5.20	From K0+000 to K3+350	Reinforced concrete surface: 12 cm thick, Neoweb talus	Surface: 3,350m and field-side talus: 3,220 m
2	North bank dyke of Khang Chien 1 and the field-side talus	2,600	4.00	3.00	From +4.20 to +5.20	From K0+000 to K0+630	Reinforced concrete surface: 12 cm thick, Neoweb talus	Surface: 2,600m and field-side talus: 1,750m
					+3.80	From K0+630 to K2+600		
3	West bank dike of Khang Chien canal (from Hong Ngu – Vinh Hung canal to the border of Hong Ngu and Tam Nong)	4,544	4.00	3.00	From +3.90 to +5.10	From K0+000 to K0+900; From K3+035 to K3+600	Reinforced concrete surface: 12 cm thick	Surface
					+3.80	From K0+900 to K3+035; From K3+600 to K4+544		
III	Tam Nong district	30,775						
1	East bank dike of Khang Chien canal (from border canal of Hong Ngu – Tam Nong to Dong Tien canal)	10,175	5.00	3.50	+3.50	From border canal of Hong Ngu – Tam Nong to Trung Tam canal	Reinforced concrete surface: 12 cm thick	Surface
					From	From Trung Tam		

No.	Item	Dimension (m)					Structure	Note
		Length	Foundation	Surface	Elevation	Section		
					+3.50 to +4.90	canal to Dong Tien canal		
2	North bank dike of Dong Tien canal (from Hai Thang Chin canal to Thong Nhat canal)	10,000	5.00	3.50	From +3.50 to +5.20	From K0+000 to K10+000	Reinforced concrete surface: 12 cm thick	Surface
3	East bank dike of Hai Thang Chin canal (from An Binh canal to border canal of Thanh Binh – Tam Nong)	10,600	5.00	3.50	From +3.50 to +5.80	From K0+000 to K10+600	Reinforced concrete surface: 12 cm thick	Surface
IV	Thanh Binh district	23,221						
1	East bank dike of Khang Chien canal (from Duong Gao canal to border canal of Tam Nong)	3,094	5.00	3.50	From +3.50 to +4.30	From K0+000 to K3+094	Reinforced concrete surface: 12 cm thick	Surface
2	West bank dyke of Thong Nhat canal (from An Phong – My Hoa canal to Duong Gao canal)	4,917	5.00	3.50	From +3.50 to +5.60	From K0+000 to K4+917	Reinforced concrete surface: 12 cm thick	Surface
3	North bank dyke of An Phong – My Hoa canal (from Hai Thang Chin canal to Thong Nhat canal)	6,050	5.00	3.50	From +3.50 to +4.90	From K0+000 to K2+050; From K2+550 to K6+050	Reinforced concrete surface: 12 cm thick	Surface
					+3.50	From K2+050 to K2+450		
4	East bank dyke of Hai Thang Chin canal (from An Phong – My Hoa to border canal Tam Nong)	5,585	5.00	3.50	From +3.50 to +3.80	From K0+000 to K1+000; From K1+350 to K2+150; From K5+100 to K5+585	Reinforced concrete surface: 12 cm thick	Surface
					+3.50	From K1+000 to		

No.	Item	Dimension (m)					Structure	Note
		Length	Foundation	Surface	Elevation	Section		
						K1+350; From K2+150 to K5+100		
5	South dyke bank of Duong Gao canal (from Khang Chien canal to Thong Nhat canal)	3,575	5.00	3.50	From +3.80 to +4.30	From K0+000 to K3+575	Reinforced concrete surface: 12 cm thick	Surface
Total		77.470						

Figure 1.4: The overall map of structural works

Figure 1.5: Location of constructions in Hong Ngu district

Figure 1.6: Location of constructions in Thanh Binh district

Figure 1.7: Location of constructions in Hong Ngu town

Figure 1.8: Location of constructions in Tam Nong district

Figure 1.9: Typical cross-section of reinforcing surface and talus on the field side of Muong Lon canal (Hong Ngu town)

Figure 1.10: Typical cross-section of strengthening semi-embankment by Neoweb technology

Figure 1.11: Typical cross-section of reinforcing west bank of Khang Chien canal (bordered with Tan Thanh – Lo Gach)

Figure 1.12: Typical cross-section of reinforcing bank of Hai Thang Chin canal (bordered with Hong Ngu – Vinh Hung)

Figure 1.13: Typical image of Cay Dua culvert $B = 3.5$ m (Hong Ngu)

Figure 1.14: Basic design of the culvert on Ca Gao – Thanh Binh Canal ($B=5$ m)

Figure 1.15: Image of the typical pumping station

1.4.3. Non-structural works

Besides investment in structural items, there are non-structural items such as demonstration of livelihood models and training, technical support such as:

- Implementation of livelihoods models: identified 7 models in the subproject area spreading over 4 districts (to replace the precarious 3-rice production model) as follows:
 - Model 1: 2 rice crops, 1 natural fish.
 - Model 2: 2 rice crops, 1 giant freshwater shrimp.
 - Model 3: 1 rice, 1 cash crop, 1 natural fish.
 - Model 4: 2 rice, duck, natural fish.
 - Model 5: 1 rice, 1 natural fish, aquatic plants (lotus, Sesbania sesban).
 - Model 6: 2 rice, 1 shrimp, natural fish.
 - Model 7: lotus, cultured fish, tourism combination.
- Technical assistance:
 - Organize training courses for people to operate, manage and regulate water for specific production models, ensure flood water easily enters into fields, create a passage for fish and other aquatic organisms in the floodplain ecosystem;
 - Build and strengthen the organizational structure of community-based management, involving people in all production activities in the subproject area;
 - Develop programs and training courses on farming techniques, plant protection, processing and preservation of post-harvest products for TOT and farmers in the beneficiary area.
 - Support the capital to 03 hatcheries of the province to meet the need of the area.

The number, location and scale of the proposed livelihoods models are presented in *Table 1.6*.

Table 1.6: Flooding livelihood models and location of demonstration sites

No.	Model	Location of demonstration	Area (ha)	Number of trained household	Scale (ha)
I. HONG NGU DISTRICT			3,047	2,584	90
1	W/S rice + S/A rice + natural fish, cultured fish	Zone I, Binh Hoa Ha Hamlet - Thuong Thoi Hau B	1,187.3	153	10
		Zone III of Hamlet 2 and Hamlet 6 - Thuong Thoi Hau B			10
2	W/S rice + S/A rice + giant freshwater shrimp	The area outside the dyke under Binh Hoa Trung hamlet - Thuong Thoi Hau A	1,110	22	10
		Small dike area under Binh Hoa Ha Hamlet – Thuong Thoi Hau B		90	10
		Zone II of Hamlet 1 and			10

No.	Model	Location of demonstration	Area (ha)	Number of trained household	Scale (ha)
		Hamlet 6 – Thuong Thoi Hau B			
3	W/S rice, ducks + S/A rice, ducks+ natural fish, cultured fish	Zone 2, Giong Bang Hamlet – Thuong Phuoc 1	700	960	10
		Compartment No,1, Binh Hoa Thuong Hamlet – Thuong Thoi Hau A		748	10
4	W/S rice + flood vegetable + natural fish, cultured fish	Zone I, Binh Hoa Ha Hamlet – Thuong Thoi Hau B	50	100	10
5	W/S rice + S/A rice + natural fish, cultured fish, aquatic plants (lotus, Sesbania sesban,...)	Zone 2, Giong Bang Hamlet – Thuong Phuoc 1		511	10
II. HONG NGU TOWN			2,206	1,437	60
1	W/S rice + S/A rice + natural fish, cultured fish	Zone 3, An Hoa Hamlet – An Binh A	467	332	10
		Zone 3, Hamlet 2, An Binh B Commune	277	162	10
		Zone 10, Binh Ly Hamlet – Binh Thanh	77	345	10
		Zone 3, Binh Chanh Hamlet – Binh Thanh	450	266	10
2	W/S rice + S/A rice + giant freshwater shrimp	Zone 8, Binh Thanh A Hamlet – Binh Thanh	375	302	10
3	W/S rice + Winter rice + cultured fish/shrimp natural fish	Zone 5, Binh Thanh Commune	560	30	10
III. TAM NONG DISTRICT			2,015	1,100	50
1	W/S rice + S/A rice + natural fish, cultured fish	Compartment No,5 – An Hoa	352	186	10
		Compartment No,5 – An Long	412	502	10
		Compartment – Phu Ninh	181	20	10
2	W/S rice + S/A rice + giant freshwater shrimp	Cu Lao Chim zone, Phu Thanh B Commune	120	22	10
3	(lotus + cultured fish) + tourist	Compartment No,13, Phu Tho Commune	950	370	10

No.	Model	Location of demonstration	Area (ha)	Number of trained household	Scale (ha)
IV. THANH BINH DISTRICT			2,409	653	50
1	W/S rice + S/A rice + natural fish, cultured fish	Famer groups No. 3-4, Hamlet 2, Phu Loi commune	909.75	217	10
		Famer group No. 5, Hamlet 3, Phu Loi commune			10
2	W/S rice + S/A rice + giant freshwater shrimp	Famer group No. 6, Hamlet 6, Phu Loi commune	701.7	186	10
3	W/S rice + flood vegetable + natural fish, cultured fish	Famer group No. 7 Hamlet 4, Phu Loi commune	797.13	250	10
		Famer group No. 8, Hamlet 2, Phu Loi commune			10
	TOTAL		9,677	5,774	250

Note: W/S= Winter – Spring; S/A = Summer-Autumn

Figure 1.16: Flood production models of ICRSL project in Dong Thap province

No	Farming system	Month/ year												Irrigation requirement		
		1	2	3	4	5	6	7	8	9	10	11	12	Full flood control	Agust flood	Water supply/drainage
1	Winter spring rice + Summer-autumn rice + Cultured fish, natural fish	Spring rice			Summer rice			Natural fish						None	Yes	Yes
2	Winter spring rice + Summer-autumn rice + Giant fresh shrimp	Spring rice			Summer rice			giant fresh shrimp						None	Yes	Yes
3	Winter spring rice + Vegetable +Cultured fish, natural fish	Spring rice			etable (chilli, maize)			Natural fish						None	Yes	Yes
4	Winter spring rice +summer-athumn rice / duck + Cultured fish, natural fish	Spring rice, duck			Summer rice, duck			Natural fish						None	Yes	Yes
5	Spring rice + summer rice + natural fish, flood vegetable (lotus, Dien dien (Sesbania sesban) flowers,...)	Spring rice			Summer rice			fish+ flood vege.						None	Yes	Yes
6	Spring rice + Summer rice + Shrimp/Cultured fish, natural fish	Spring rice			Summer rice			shrimp/natural fish						None	Yes	Yes
7	Lotus + cultured fish + tourism	lotus + black breeding fish+ tourism												None	Yes	Yes

Figure 1.17: Seasonal calendar for flood livelihood models

1.5. CONSTRUCTION METHODS AND EQUIPMENT FOR THE SUBPROJECT

1.5.1. Dredging canals

a). From K0 + 000 to K4 + 100 of the canals of Khang Chien, Hong Ngu - Tam Nong, Tam Nong Thanh Binh, Ca Cai

- Embanking to block water from the fields with a bucket excavator of 0.8 m³;
- Dredging canal with dredger ≤ 1.2 m³ (Figure 1.8);
- Repairing and roofing the canal banks.

Figure 1.18: Dredging canal with dredger

b). From K4 + 100 to K30 + 288 of the canals of Khang Chien and Khang Chien 1

- Embanking to block water from the fields with a bucket excavator of 0.8 m³.
- Installing plastic pipe diameter d = 114 mm.
- Digging ditches by digging machine bucket 0.8 m³.

- Dredging canal by a vessel with a capacity of $\leq 2000\text{CV}$, pipe height ≤ 5 m, pipe length ≤ 1700 m from the dredging site to the sludge storage (*Figure 1.9*).

Figure 1.19: Dredging canal by a vessel with a capacity of below 2000CV

1.5.2. Strengthening semi-dykes and canal heads

a). Constructing talus

- Digging of foundation pit: Using a digging machine with a capacity of 0.8 m³ digging pit holes for land pouring along the right bank or transporting to the ground to dry the soil and manually excavate the foundation and repair the foundation to achieve design elevation.
- Pilling melaleuca piles.
- Concrete foundation: Using a concrete mixer, stone 1x2 M250, pour the mixture interlaced into Melaleuca, this concrete layer must be compacted as concrete pre-stressed concrete. Any movement on the surface is only allowed after 24 hours.
- Installation of steel and coffer.
- Concrete: Using a concrete mixer, stone 1x2 M250. It is poured down with the gutter system, compacted by compactor 1.5KW, raked by handed rake. The concrete layer must be strong and waterproof.
- Executing talus: (i) creating a roof and bottom elevation as designed. At the roof of the talus, filling roof to the canal side, digging organic layer and level (teeth) to increase the adhesion, friction between the soil layer and the soil before embankment design; (ii) Apply 50 cm thick layer of soil, firmly compacted.
- Reinforcing dyke talus by E'GRID Geocell: NEOWEB is a cellular confinement system, manufactured from a HDPE alloy, it improved for concrete by structuring likely net.
- Neoweb material technology is cellular confinement, honeycomb-shaped cellular network that improves structural stability and structural reinforcement. The compartment system combined with the backfill material forms a composite structure, with enhanced geophysical and mechanical properties. The system separates, maintains and protects the interior backing materials in three directions, creating high strength in each direction (*Figure 1.20*).

Figure 1.20: Constructing talus with Neoweb material technology

b). Reinforcing dyke surface

- Using bulldozer 110cv, compactor and water tank to compact sand on the road bed (ground foundation) with a tightness of $K \geq 0.95$, ironing the slope in accordance with the design.
- Creating a slope across the road $i = 3\%$; curbside $i = 4\%$.
- Spreading plastic to waterproof and anti-dehydration for concrete, plastic fabric covered sand surface and sides of reinforced concrete panels.
- Processing reinforced plate of round steel $\varnothing 10$, the distance between the two plates is 150mm and tied with zinc at each. The outer must rust-free, the reinforced mesh ensures the correct design.
- Reinforced concrete, stone 1x2 M250 in accordance with the design has a depression of 2 - 4cm, using the compactor to the ramp. Slope across the road 2%.
- Maintain concrete by watering or moistening by sanding the surface to prevent cracking and give the concrete enough strength.
- The horizontal joints of the knitting panels made of wood, on the plank are mastic asphalt.
- Construction of signboards (*Figure 1.21*).

Figure 1.21: Strengthening semi-dykes

1.5.3. Executing culverts and pump stations

- Digging foundation: (i) excavating the foundation including the sluice, bottom, wing wall by excavator 0.8m³. Digging to the elevation of the bottom pit; (ii) complete excavation to create foundation pit mold manually to the design elevation.
- Construction of foundation pit: (i) Pile concrete, reinforce foundation with a hammer weighing $\leq 1,2T$; (ii) Pile melaleuca manually (iii) dredging and cleaning trowel before pouring concrete; (ii) drainage pits (if necessary).
- Construction of the head wall, wing wall, sluice, working floor, absorption basin, lifting frame.
- Executing sluice: digging the soil to fill the sluices, compact to reach the tightness of the design.
- Construction of knit sheet of roof: (i) install steel, formwork to concreting; (ii) install concrete sheet into the roof, dike, etc.
- Construction of road plates: (i) install steel, formwork prepares for concreting; (ii) install concrete sheet into necessary position...
- Clean and return the site (*Figure 1.22*).

Figure 1.22: Constructing open culvert

1.6. LIST OF MACHINERY AND EQUIPMENT

The list of machinery and equipment to be used for the construction of the subproject is summarized in *Table 1.7* and most of those are second hand. However, they are regularly maintained and the depreciation rate is only 10-20%.

Table 1.7: List of equipment and machinery using for the subproject

No.	Equipment	Unit	Quantity	Number of sites
<i>I</i>	<i>Dredging canal</i>			
1	Excavator bucket, crawler - bucket capacity 0.80 m ³	piece	3	6
2	Excavator Bucket - bucket capacity of 1.20 m3	piece	3	6

No.	Equipment	Unit	Quantity	Number of sites
3	Barge works - tonnage 300.0 T	piece	3	6
4	Excavator bucket, crawler - bucket capacity 0.40m ³	piece	3	6
5	Ironing machine - capacity 108.0 CV	piece	3	6
6	Dredger - 1200 CV capacity	piece	3	6
7	Ships and towing service (anchoring, oil supply, etc.) - capacity of 360 CV	piece	3	6
8	Floating crane, tow - lifting capacity 30T	piece	3	6
9	Boats - capacity 23 CV	piece	3	6
10	Portable generator - capacity 50.0 kW	piece	3	6
11	Electric winch - pulling force 3.0 T	piece	3	6
II	<i>Execution digging and embossing</i>	piece		
1	Excavator bucket, crawler - bucket capacity 0.80 m ³	piece	4	8
2	Ironing machine - capacity 108.0 CV	piece	5	8
3	Dump Truck - 5,0 T	piece	1	8
4	Automobile watering - capacity 5.0 m ³	piece	1	8
5	Tanker Truck - Tonnage 7.0 T	piece	1	8
III	<i>Execution of concrete</i>	piece		
1	Concrete compactor, table dressing - capacity 1.0 kW	piece	4	8
2	Concrete compactor, beamer - capacity of 1.5 kW	piece	4	8
3	Self-propelled vibrator - 25T	piece	1	8
4	Crankshaft hoists - lifting capacity 16.0 T	piece	3	8
5	Crawler crane - lifting capacity 10.0 T	piece	2	8
6	Tail breezier + crawler head - weight 9.0 T	piece	3	8
7	Self-propelled airbags - weight 16.0 T	piece	1	8
8	Self-propelled airbags - Weight: 9 T;	piece	1	8
9	Self-propelled steel wheels - weight 10.0 T	piece	1	8
10	Vertical Drilling Machine - Capacity 4.5 Kw	piece	3	8
11	Concrete mixer - 250.0 liters capacity	piece	3	8
12	Concrete mixer - capacity 500.0 liters	piece	4	8
III	<i>Execution formwork</i>	piece		
1	Grinder - power 1,0 kW	piece	1	8
2	Grinder - 2.7 kW	piece	2	8
3	Compressor, diesel engine - capacity 240.00 m ³ /h	piece	1	8
4	Compressor, diesel engine - capacity 360,00 m ³ /h	piece	2	8
5	Milling machine - capacity of 7.0 kW	piece	2	8
6	Turning machine - 10 kW	piece	2	8
7	AC welding alternator - capacity 23.0 kW	piece	3	8

No.	Equipment	Unit	Quantity	Number of sites
8	Cutting machine - power 2.8 kW	piece	1	8
9	Cutting machine Plasma	piece	3	8
10	Shearing machine - capacity 15.0 kW	piece	2	8
11	Steel bending machine - capacity 5.0 kW	piece	4	8
12	Metal saw - capacity 2.7 kW	piece	2	8
13	Hoist - lifting capacity 0.8 T - H _{lifting} 80 m	piece	3	8

Labor demand for subproject:

Labor demand for subproject is expected to be 230-270 people on average and 300 people at peak (*Table 1.8*) during the construction phase and 10-15 persons in the operation phase. In the construction phase, the contractor will arrange camps for workers at the construction sites, camps with mobile toilets, health centers and clean water tanks. During operation, operators will live at the construction managing dwelling.

Table 1.8: Number of workers at peak times

Items	Dredging canal	Strengthening semi-dikes	Culvert - pumps	Total
Worker (person)	20-30	30-40	180-200	230-270

1.7. AFFECTED AREA OF THE SUBPROJECT

- During the construction phase:

- Dredging: impacts on the surrounding area with the radius of about 500m and waste disposal sites, impacts are local, occur only during construction. Given that in some areas of raising aquaculture such as the head of Khang Chien canal adjacent to Vinh Hung - Hong Ngu canal (Pangasius farming area) and Cu Lao Chim section of Tam Nong district (white leg shrimp and giant freshwater shrimp farming).
- Strengthening semi embankments and spillways: Impacts on areas around the radius of 100-200m. This activity will affect households living along the strengthening routes. However, people live only in some main residential clusters, such as residential areas of Khang Chien, Ca No, An Binh B, North Dong Tien canal. The remaining population lives scattered along the hardening routes. The impacts are short-term, along the dike and can be controlled.
- Construction of culverts, pump stations: Impact radius 100-200m. This impact is mainly by noise. The culverts/pumping stations are concentrated in Hong Ngu town and Hong Ngu districts. Some sewers are located on the residential lines (RLs), the rest are outside the fields. Note that in Tam Nong district there is a sewer/pumping station in the compartment No. 13 located 70m away from Tram Chim NP. The main impact is noise, however, this culvert is small, and using melaleuca piles, Tram Chim NP is protected by a guard station, so the impact is low. Each sewer/ pumping station will be constructed in 3-6 months, maximum of 6 months to avoid the annual flood, the impacts can be controlled.

- During operation phase: When the construction of strengthening embankment, culverts, sluices and pumping stations is finished, it will actively support the livelihoods models

spreading to the whole area with the area of 22,806ha and improve the livelihoods of people in the whole subproject area (*Figure 1.23*).

Figure 1.23: The benefit area of the subproject

There are no historical, cultural, spiritual and archaeological sites at all levels (local, provincial, national as well as international) in the subproject area.

Some natural receptors around the subproject area include Tram Chim NP, Gao Giong Ecological Tourism Area, Lang Sen Wetland Reserve, Bung Binh Thien Ecosystem, Sam Mountain, Tra Su Melaleuca forest, Dai mountain, Cam mountain, Tuc Dup mountain. Most of these natural receptors are located 10 to 60 km from the subproject area, except Tram Chim NP adjacent to the subproject. See *Figure 1.24* and *Table 1.9* for details.

Figure 1.24: Natural receptors in the subproject area

Table 1.9: Distance from natural receptors to the subproject location

No.	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
1	Tram Chim National Park	0.07	Culvert + West bank Pump Station of Phu Thanh 3 Canal (Thong Nhat) (Compartment No.13)- (combined irrigation culvert)
2	Gao Giong Ecological Tourism Area	10	Hardening semi-dyke of the northern bank of An Phong – My Hoa (from canal 2/9 to Thong Nhat canal)

No.	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
3	Lang Sen Wetland Reserve	25.6	Culvert + West bank Pump Station of Phu Thanh 3 Canal (Thong Nhat) (compartment No.13)-(combined irrigation culvert)
4	Bung Binh Thien Ecosystem	15.5	Reinforcing semi-dyke of the eastern bank of Suon 2 canal
5	Sam Mountain	27.5	Reinforcing semi-dyke of the eastern bank of Suon 2 canal
6	Tra Su Melaleuca forest	37.4	Reinforcing semi-dyke of the eastern bank of Suon 2 canal

No.	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
7	Dai Mountain	55.2	Reinforcing semi-dyke of the eastern bank of Suon 2 canal
8	Cam Mountain	47.8	Reinforcing semi-dyke of the eastern bank of Suon 2 canal
9	Tuc Dup Mountain	60.2	Reinforcing semi-dyke of the eastern bank of Suon 2 canal

Socio-economic receptors in the subproject area can be counted as primary, secondary, high school, market, people's committees, clinics, border guard stations. These located near the construction site of the subproject with a common distance of 50 - 600m, so it should be noted during the construction process. See *Table 1.10* and *Figure 1.25* to *Figure 1.28* for details.

Table 1.10: Distance from sensitive socio-economic receptors to the subproject location

No.	Name of the object	Distance to the nearest construction (km)	Note: nearest construction
I	Hong Ngu District		
1	Border Station	0.8	Muong Vop Pump Station
2	Thuong Thoi Hau A CPC	0.98	Muong Vop Pump Station
3	Thuong Thoi Hau B Secondary School	0.79	Xeo Chon Pump Station

No.	Name of the object	Distance to the nearest construction (km)	Note: nearest construction
4	Thuong Thoi Hau B CPC	0.6	Cay Dua Sluice
5	Cau Muong Market	0.27	Cay Dua Sluice
II	Hong Ngu Commune		
1	Binh Thanh Primary School	0.25	Strengthening spillway of Binh Thanh 2 Canal, bordered with Tan Thanh – Lo Gach (2 banks)
2	Binh Thanh High School	2.3	Strengthening semi-dike: North bank of Khang Chien 1 canal
3	Binh Thanh CPC	2.0	Strengthening semi-dyke: North bank of Khang Chien 1 canal
4	An Binh B Primary School	0.20	Strengthening spillway: Khang Chien canal bordered with Hong Ngu – Vinh Hung Canal (the east bank)

No.	Name of the object	Distance to the nearest construction (km)	Note: nearest construction
5	An Binh B CPC	0.60	Strengthening spillway: Khang Chien canal bordered with Hong Ngu – Vinh Hung Canal (the east bank)
III	Tam Nong District		
1	Phu Thanh B Primary School	0.17	Strengthening semi-dyke: East bank of Khang Chien canal (bordered canal of Hong Ngu town-Tam Nong and Thanh Binh-Tam Nong)
2	Phu Thanh A Wharf	0.05	Strengthening semi-dyke: North bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
3	Phu Thanh A High School	0.19	Strengthening semi-dyke: North bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
4	Phu Thanh A CPC	0.15	Strengthening semi-dyke: North bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
5	Phu Tho CPC	0.2	Strengthening semi-dyke: North bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)

No.	Name of the object	Distance to the nearest construction (km)	Note: nearest construction
IV	Thanh Binh District		
1	Phu Loi Primary School	0.05	Strengthening semi-dyke: East bank of Khang Chien canal (from Duong Gao Canal to the bordered canal of Tam Nong)
2	Phu Loi Secondary School	0.05	Dredging Khang Chien Canal (from Tam Nong-Thanh Binh canal to An Phong-My Hoa canal)
3	Health Station of Phu Loi Commune	0.05	Dredging Khang Chien Canal (from Tam Nong-Thanh Binh canal to An Phong-My Hoa canal)

Figure 1.25: Sensitive receptors in Thanh Binh district

Figure 1.26: Sensitive receptors in Tam Nong district

Figure 1.27: Sensitive receptors in Hong Ngu town

Figure 1.28: Sensitive receptors in Hong Ngu district

1.8. MATERIAL SUPPLIES

- Sources for materials : In the construction site, there are only materials used for filling (soil), other materials such as iron, cement, timber, stone, sand must be bought and transported from other places. Iron, cement purchased in Dong Thap.
- Means to transport materials: mainly by waterway using barge or large boat. When approaching the site area, it is necessary to switch to other inland roads using vehicles. The remaining is carried manually (*Figure 1.29*).

The main raw materials of the subproject are shown in *Table 1.11*.

Table 1.11: Volume of materials for construction

No.	Materials	Unit	Mass					Total
			Dredging canals	Reinforcing semi-dykes	Reinforcing spillways	Culverts, sluices	Pumping stations	
1	Dredging mass	100m ³	4,188.2	-	-	-	-	4,188.2
2	Excavated soils	100m ³		1,339.7	166.3	342.8	191.8	2,040.6
3	Filling soils	100m ³	-	1,657.2	10.7	276.9	230.9	2,175.6
4	Sand	100m ³	-	276.9	4.0	3.3	-	284.3
5	Melaleuca pile	100m	-	14,797.1	1,280.0	3,411.4	2,846.4	22,334.9
6	Concrete pile	100m	-	-	-	253.8	-	253.8
7	Concrete	m ³	-	52,855.8	3,345.5	6,184.6	4,292.3	66,678.3
8	Reinforcing steel	Ton	-	3,256.3	127.8	765.4	375.4	4,524.9
9	Formwork	100m ²	-	354.3	84.0	213.6	152.4	804.2
10	Plastic sheet	100m ²	-	4,163.7	703.2	124.5	163.4	5,154.9
11	Gabion	unit	-	-	3,600.0	579.0	68.3	4,247.2

Figure 1.29: Routes for construction material transportation of the subproject

1.9. DISPOSAL SITES AND TRANSPORTATION ROUTES

The volume of excavated soil of the subproject is $204,600\text{m}^3$ and this soil will be reused in place for embanking and ground filling. No waste is disposed of.

The total volume of dredged soil to be dumped is $418,820\text{m}^3$. It is anticipated that the entire volume of this material will be transferred to 7 disposal sites and 4 canal embankment routes to upgrade the August embankment. The ESIA consultant has conducted supplement site-survey at all proposed disposal sites and their surrounding areas to collect background information as a basis for assessment. These dumps will be located right along the dredging route to minimize the transport distance. Dredging, transportation routes for waste from dredging areas to the disposal sites and typical features of the disposal sites are shown in *Figure 1.30*.

Figure 1.30: Dredging, transportation routes for sludge from dredging to the disposal sites

Table 1.12: Location and area of disposal sites

No.	Name of site	Area (ha)	Location	Coordinate system VN2000, meridian axis 105°00, Projection 3°		
				Corner point	X (m)	Y (m)
I	Disposal site	15,0				
1	Site No.1	2.0	Binh Thanh commune, Hong Ngu town	(a)	1195925.58	541292.54
				(b)	1196083.98	541321.18
				(c)	1196062.52	541441.48
				(d)	1195904.26	541415.38
2	Site No. 2	1.5	An Binh A, commune, Hong Ngu town	(a)	1194766.57	542514.04
				(b)	1194713.49	542429.77
				(c)	1194587.15	542510.97
				(d)	1194640.23	542593.49
3	Site No. 3a	2.31	An Binh A, commune, Hong Ngu town	(a)	1192648.24	543921.47
				(b)	1192614.90	543877.83
				(c)	1192266.96	544109.06
				(d)	1192297.07	544153.68
4	Site No. 3b	1.76	An Binh B,	(a)	1192687.28	544095.91

No.	Name of site	Area (ha)	Location	Coordinate system VN2000, meridian axis 105°00, Projection 3°		
				Corner point	X (m)	Y (m)
			commune, Hong Ngu town	(b)	1192656.70	544050.03
				(c)	1192390.94	544226.49
				(d)	1192421.63	544269.76
5	Site No. 3c	1.43	An Binh b, commune, Hong Ngu town	(a)	1192365.68	544325.65
				(b)	1192340.53	544276.30
				(c)	1192109.84	544396.61
				(d)	1192134.99	544443.79
6	Site No. 4	5.0	Phu Thanh B, Tam Nong district	(a)	1189278.27	546269.42
				(b)	1189204.83	546107.53
				(c)	1189036.81	546173.39
				(d)	1189082.62	546390.33
7	Site No. 5	1.0	Phu Loi commune, Thanh Binh district	(a)	1175560.38	552520.72
				(b)	1175539.26	552497.48
				(c)	1174759.71	553122.66
				(d)	1174779.73	553144.51
II	Sites along canal bank	6.66				
1	Khang Chien canal section from K0-K4+100	1.64	An Binh B, commune, Hong Ngu town	First point	1199792.04	541195.39
				End point	1195844.34	541863.95
2	Border canal of Hong Ngu - Tam Nong	1.42	An Binh B, commune, Hong Ngu town	First point	11898436.88	541661.598
				End point	11913200.65	544845.839
3	Border canal of Tam Nong – Thanh Binh	2.01	Phu Loi commune, Thanh Binh district	First point	11778279.31	550574.489
				End point	11791187.45	554225.397
4	Ca Cai canal	1.59	Phu Loi commune, Thanh Binh district	First point	11766887.97	551455.724
				End point	11751618.87	548780.71

1.10. AUXILIARY WORKS

- The main source of electricity is from the national grid. Contractors will sign contracts with the electricity authority form districts/township in the subproject area to get electricity for construction activities.
- Petrol and oil used for construction machines and transport vehicles are taken from petrol stations in the area.
- Water for construction: can be used directly from residential water, surface water from rivers, canals near the construction sites.

- Worker camps:
 - For dredging items: Construction is mainly on barges, so camp will not be built on canal banks but use barges as a camp for workers to rest in the working. After working hours, workers will move from the construction site to live with local people at 2 sides of the canal near the construction site. As a result, camps are not built.
 - For strengthening embankment and spillways: With the characteristic of route construction, there have people living scattered along the two sides of the embankments and spillways, so there are no needs to build worker camps and the workers will live in the local people near the construction routes during their working there.
 - For open culverts, sluices and pump stations: Each item will be provided with temporary houses for construction workers. Most of the culverts are small with an aperture of 1.5-3.5m, only 2 sluices of 5-m aperture, so the construction area is small with only 400-500m²/item. A typical construction site for a culvert is shown in the Appendix.

1.11. INVESTMENT FUND AND IMPLEMENTATION SCHEDULE

1.11.1. Investment fund

Total investment of the subproject is **664,300,000,000 VND** (In words: *Six hundred sixty four billion, three hundred million VND*). Details are in *Table 1.13*.

Table 1.13: Total investment cost of the subproject

No.	Item	Label	Amount (VND)
1	Compensation and land clearance cost	G _{GPMB}	45,439,000,000
2	Construction cost	G _{XD}	407,436,295,000
3	Management cost	G _{QLDA}	6,185,629,000
4	Consultant cost	G _{TV}	34,927,977,000
5	Other cost	G _K	23,586,948,000
6	Cost for non-structural activities	G _{sk}	90,310,000,000
7	Contingency cost	G _{DP}	56,414,151,000
Total cost		G _{VTN}	664.300.000.000

1.11.2. Implementation schedule

- Preparing a feasibility report (FS) for approval: Quarter IV / 2018
- Implementation of compensation and land clearance: 2018-2019
- Implementation of subproject: 2018-2022

1.12. ORGANIZATION FOR THE SUBPROJECT MANAGEMENT AND IMPLEMENTATION

- Subproject management agency:
 - Dong Thap PPC is the investment decision maker, which will approve the subproject implementation, procurement plan, audit report of the subproject; its agencies include

Dong Thap DARD and ICRSL Project Management Board of Dong Thap that are responsible for implementing the subproject's contents

- Dong Thap DARD is the subproject owner performing the coordinating function of the whole subproject.
- Dong Thap PPC, DPCs of Tam Nong, Thanh Binh, Hong Ngu and Hong Ngu Town in coordination with ICRSL Project Management Board of Dong Thap direct the subproject in the area, responsible for the whole compensation, land acquisition, resettlement for local people where the subproject takes place.

The chart of management and implementation organization of subproject is illustrated in *Figure 1.31*.

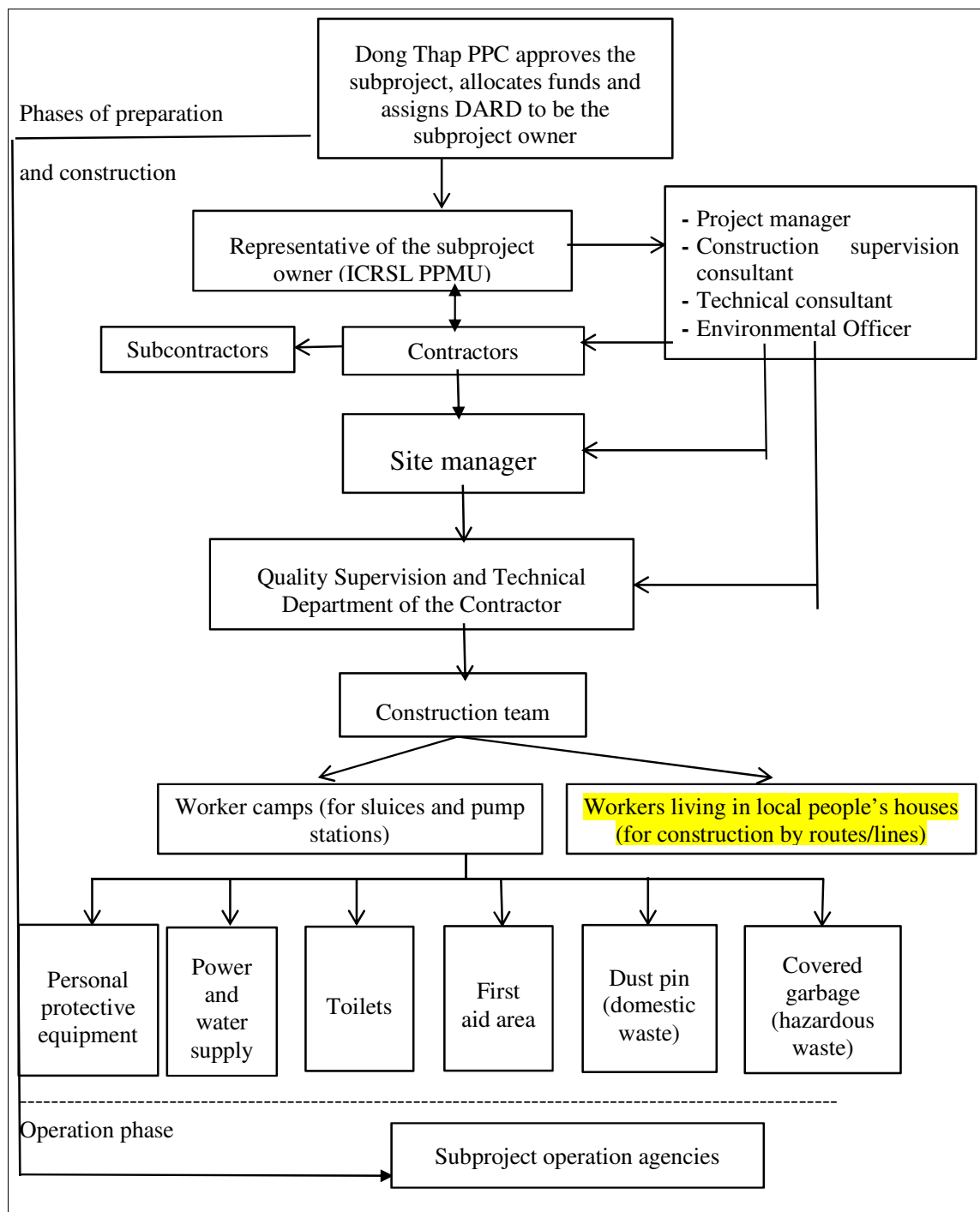


Figure 1.31: Management and implementation chart of the subproject

CHAPTER 2. NATURAL AND SOCIO-ECONOMIC CONDITIONS OF THE SUBPROJECT AREA

This chapter assesses the dimensions of the study area and describes (a) relevant natural condition; (b) the current status of environmental quality; (c) biological environment; (d) socio-economic condition; (e) characteristics of construction areas. Also takes into account current and proposed development activities within the subproject area but not directly connected to the subproject.

2.1. NATURAL CONDITION

2.1.1. The geographical location of the subproject

The geographical locations of the dredged canals, strengthening semi-dykes, strengthening spillways, sluices and culverts, pump stations are illustrated in *Table 2.1 to Table 2.5*.

Table 2.1: Details of dredged canals

	Item	Coordinate system VN2000, meridian axis 105°00, Projection 3°			
		First point		End point	
		X(m)	Y(m)	X(m)	Y(m)
I	Hong Ngu Commune				
1	Khang Chien Canal (from Tan Thanh Lo Gach Canal to Hong Ngu – Vinh Hung Canal)	1199623.489	541324.747	1195270.612	542336.454
2	Khang Chien Canal (from Hong Ngu – Vinh Hung to border canal of Hong Ngu town – Tam Nong)	1195130.039	542447.5	1191317.604	544843.412
3	Border canal of Hong Ngu town – Tam Nong (section from Hai Thang Chin Canal to Khang Chien Canal)	1189843.688	541661.598	1191320.065	544845.839
4	Khang Chien 1 Canal	1196219.566	539499.861	1195686.516	542019.427
III	Tam Nong District				
1	Khang Chien Canal (from border canal of Hong Ngu town – Tam Nong to border canal of Tam Nong – Thanh Binh)	1191289.072	544873.829	1177800.262	550562.678
IV	Thanh Binh District				
1	Khang Chien Canal (from Border canal of Tam Nong – Thanh Binh to An Phong – My Hoa Canal)	1177804.598	550585.768	1173686.312	553918.578
2	Border canal of Thanh Binh – Tam Nong (from Khang Chien Canal to Thong Nhat Canal)	1177827.931	550574.489	1179118.745	554225.397
3	Ca Cai Canal (from Khang Chien Canal to Hai Thang	1176688.797	551455.724	1175161.887	548780.71

	Item	Coordinate system VN2000, meridian axis 105°00, Projection 3°			
		First point		End point	
		X(m)	Y(m)	X(m)	Y(m)
	Chin Canal)				

Table 2.2: Details of strengthening semi-dykes in the subproject

No.	Item	Coordinate system VN2000, meridian axis 105°00, Projection 3°			
		First point		End point	
		X(m)	Y(m)	X(m)	Y(m)
I	Hong Ngu District				
1	Suon 2 canal: East bank route; top surface, canal side slope; field side slope in weak places	1204809.513	524069.98	1201549.447	526845.291
2	North bank of Tu Thuong Canal (from the intersection of Suon 2 Canal to Dia Cat canal), top surface and 2 talus	1201546.995	526851.367	1201136.413	528907.067
3	West bank of Dia Cat canal, top surface and 2 talus	1204358.911	527376.852	1201136.413	528907.067
4	North bank of Tu Thuong Canal (from Cay Da canal to So Thuong bridge), the top surface	1198972.079	535969.598	198525.312	537322.524
II	Hong Ngu Town				
1	South bank dike of Muong Lon Canal (K3 zone, An Binh A, the section from Hai Thang Chin to Kho Be residential area, B = 3 m, and hardening the roof on the field side.	1191625.481	541027.524	1192579.676	544109.937
2	West bank route of Khang Chien Canal (from Hong Ngu – Vinh Hung Canal to Hong Ngu – Tam Nong Canal), B = 3 m	1195152.711	542397.353	1191329.873	544828.207
3	North bank route of Khang Chien 1 Canal	1196173.144	539734.401	1195729.217	542015.728
III	Tam Nong District				
1	East bank route of Khang Chien Canal (from Hong Ngu – Tam Nong Canal to Thanh Binh – Tam Nong Canal)	1191312.757	544894.454	1177857.127	550580.219
2	North bank of Dong Tien Canal (from Hai Thang Chin Canal to Thong Nhat Canal)	1182860.504	543793.305	1181382.99	553781.148
3	East bank of Hai Thang Chin (from An Binh Canal to Thanh Binh – Tam Nong Canal)	1182860.504	543793.305	1188311.234	542178.761
IV	Thanh Binh District				
1	East bank route of Khang Chien Canal (section from Duong Gao	1177816.313	550612.494	1175424.718	552586.737

No.	Item	Coordinate system VN2000, meridian axis 105°00, Projection 3°			
		First point		End point	
		X(m)	Y(m)	X(m)	Y(m)
	Canal to Tam Nong Canal)				
2	West bank route of Thong Nhat Canal (section from An Phong-My Hoa Canal to Duong Gao Canal)	1178492.161	554337.932	1173667.306	555285.758
3	North bank route of An Phong-My Hoa Canal (from Hai Thang Chin to Thong Nhat Canal)	1173914.283	549470.927	1173667.306	555285.758
4	East bank route of Hai Thang Chin (section from An Phong- My Hoa to Tam Nong Canal)	1179391.116	545803.175	1173914.283	549470.927
5	South bank route of Duong Gao Canal (section from Khang Chien Canal to Thong Nhat Canal)	1175398.669	552629.023	1178492.161	554337.932

Table 2.3: Details of strengthening overflow passage

No.	Item	Coordinate system VN2000, meridian axis 105°00, Projection 3°			
		First point		End point	
		X(m)	Y(m)	X(m)	Y(m)
I	Hong Ngu town (7 Canals; 9 banks)				
1	Thong Nhat Canal border So Ha river (West bank)	1204951.086	540672.541	1204785.32	540788.135
2	Khang Chien Canal border Tan Thanh – Lo Gach Canal (2 banks)	1199642.533	541320.775	1199453.623	541353.203
3	Binh Thanh 2 border Tan Thanh – Lo Gach Canal (2 banks)	1200244.796	542602.254	1200090.718	542723.021
4	Thong Nhat Canal border Tan Thanh – Lo Gach Canal (West bank)	1200850.734	543836.002	1200709.577	543965.867
5	Canal 2/9 border Hong Ngu – Vinh Hung Canal (East bank)	1194871.00	539922.756	1194691.022	539973.697
6	Khang Chien Canal border Hong Ngu – Vinh Hung Canal (East bank)	1195159.262	542475.104	1194991.023	542574.34
7	An Binh Canal (Ba Anh Canal) border Hong Ngu – Vinh Hung Canal (East bank)	1195454.786	545254.608	1195259.762	545307.116
II	Hong Ngu district (3 canal heads and 2 sluice heads)				
8	Canal head of Ca Sach adjacent to So Thuong River (2 banks)	1204174.450	529732.203	1204100.377	529699.778
9	Canal head of Coi Tieu adjacent to So Thuong River	1203406.374	531731.338	1203346.111	531684.023

	(2 banks)				
10	Canal head of Coi Dai adjacent to So Thuong River (2 banks)	1202943.033	532648.572	1202931.591	532572.968
11	Head of Ca Cat sluice and pump station combination (2 banks)	1202377.661	533814.952	1202348.144	533793.117
12	Sluice head of Nam Mung (2 banks)	1202172.523	534206.909	1202135.637	534189.941

Table 2.4: Details of sluices and sewers

No.	Items	Coordinate system VN2000, meridian axis 105°00, Projection 3°			Description of surroundings
		X (m)	Y (m)	Address	
I	Hong Ngu District				
1	Nam Mung Sluice	1202152.255	534216.344	Thuong Thoi Hau B Commune	The sluice is located on the Nam Mung canal, closed to the residential area of Thuong Thoi Hau B, the inside is the paddy field.
2	Cay Dua Sluice	1201451.413	535061.926	Thuong Thoi Hau B Commune	The sluice is located on the Cay Dua canal, next to the Cau Muong canal, with a few households living, inside is the paddy field.
3	Repair of Dau Ca Cat sluice + Pump Station	1202371.526	533824.068	Thuong Thoi Hau B Commune	The sluice is located on Ca Cat canal, closed to the residential area Thuong Thoi Hau B, inside is paddy field.
4	Hau Ca Cat Sluices + Pump Station	1200070.455	532393.553	Thuong Thoi Hau B Commune	The sluice is at the end of Ca Cat canal, next to the Tu Thuong canal, surrounded by paddy fields
5	Sau Quang Sluice + Pump Station	1198685.504	536880.441	Thuong Thoi Hau B Commune	The sluice is located on the north bank of the Tu Thuong canal, 500 m from the So Thuong River, surrounded by paddy fields
6	Hau Muong Vop Sluice + Pump Station	1202933.887	528019.689	Thuong Thoi Hau A Commune	The sluice is located on the east bank of Da Cat, surrounded by paddy fields
7	Hau Bao Goc Sluice + Pump Station	1200772.466	530085.711	Thuong Thoi Hau A Commune	The sluice is located on the north bank of Tu Thuong canal, surrounded by paddy fields
II	Hong Ngu Commune				
1	Sluices + Ong On Pump Station (K1-Tan Hoi)	1200539.114	538561.781	Tan Hoi Commune	The sluice is located on the northern bank of So Ha river, surrounded by paddy fields and some 100m from

No.	Items	Coordinate system VN2000, meridian axis 105°00, Projection 3°			Description of surroundings
		X (m)	Y (m)	Address	
					Pangasius HHs
2	Sluices + Bay Muoi Hai Pump Station (K2-An Binh B)	1195370.282	547888.819	An Binh B Commune	The sluice is located on the west bank of Thong Nhat canal, on the residential route of An Binh B commune, near the sluice is some households, inside is the paddy field and some 50m away from some Pangasius fish farmers.
3	Sluices + Ong Nhon Pump Station (K2-An Binh B)	1193474.39	548788.249	An Binh B Commune	The sluice is located on the west bank of Thong Nhat canal, near the sluice with a household, inside is the paddy field and right next to the sluice has a catfish pond.
4	Hai Xang Sluice (K1 – Tan Hoi)	1201073.171	539157.614	Tan Hoi Commune	The sluice is located on the west bank of Doi Ha, surrounded by paddy paddies and some 50m from some Pangasius HHs
5	Dia Sinh Sluice (K3-Binh Thanh)	1199828.778	544695.318	Binh Thanh Commune	The sluice is located on the west bank of Thong Nhat canal, near the sluice with 2 households raising pangasius, surrounded by paddy fields
6	Tau Cuoc Sluice (K3-An Binh A) – (combined irrigation and drainage)	1191152.576	544116.98	An Binh A Commune	The sluice is located on the northern bank of the HN-TN canal, surrounded by paddy fields
7	Kho Be Sluice (K3-An Binh A)- (irrigation sluice)	1192148.038	544363.55	An Binh A Commune	The sluice next to Kho Be RA, inside is the paddy field
III	Tam Nong District				
1	Sluice + West bank Pump Station of Phu Thanh 3 Canal (Thong Nhat) (Compartment No.13)- (combined irrigation and drainage)	1182944.779	553263.311	Phu Tho Commune	The sluice is located on the west bank of Thong Nhat canal, with a radius of 200 m, with about 10 HHs scattered, surrounded by paddy fields. The other side of the river is Tram Chim NP
2	Sluice + West bank Pump Station of Khang Chien Canal (Cu Lao Chim)- (irrigation sluice)	1185955.545	547614.837	Phu Thanh B Commune	The sluice is located on the west bank of the Khang Chien canal, surrounded by the shrimp farming area

No.	Items	Coordinate system VN2000, meridian axis 105°00, Projection 3°			Description of surroundings
		X (m)	Y (m)	Address	
3	Sluice + West bank Pump Station of An Long 2 Canal (Compartment No.5-Phu Ninh)- (drainage sluice)	1183304.27	545509.818	Phu Ninh Commune	The sluice is located on the west bank of An Long 2 around paddy fields
4	Sluice + North bank Pump Station of Dong Tien Canal (Compartment No.14)- (combined irrigation and drainage)	1181974.728	549769.724	Phu Tho Commune	The sluice is located on the north bank of Dong Tien canal, surrounded by a crowded residential area, inside is paddy fields
5	Sluice + North bank Pump Station of Dong Tien Canal (Compartment No.13) - (combined irrigation and drainage)	1181704.39	551632.86	Phu Tho Commune	The sluice is located on the north bank of Dong Tien canal, near the sluice with only one HH, paddy field inside
6	Sluice + West bank Pump Station of An Long 2 Canal (Compartment No.5 An Long)- (drainage sluice)	1184384.52	545291.111	An Long Commune	The sluice is located on the west bank of An Long 2 around paddy fields
IV	Thanh Binh District				
1	Sluice of Ca Gao canal (border the An Phong - My Hoa canal)	1173920.829	549745.681	Phu Loi Commune	The sluice is located on the canal, border the An Phong - My Hoa canal, 50m away from a few HHs, surrounded by paddy fields.
2	Ca Gao Sluice (border the Duong Gao canal)	1174487.24	552121.338	Phu Loi Commune	The sluice is located on the canal, border the Paddy Channel, near the sluice with a HH living, surrounded by paddy fields.

Table 2.5: Details of pump stations

No.	Items	Coordinate system VN2000, meridian axis 105°00, Projection 3°			Description of surroundings
		X (m)	Y (m)	Commune	
I	Hong Ngu District				

No.	Items	Coordinate system VN2000, meridian axis 105°00, Projection 3°			Description of surroundings
		X (m)	Y (m)	Commune	
1	Muong Vop Station	1204239.212	529660.481	Thuong Thoi Hau A	Located at the residential area of Thuong Thoi Hau A, Muong Vong canal, two crowded residential areas, paddy fields
2	Chin Hue Station	1202551.482	533439.126	Thuong Thoi Hau B	Located at the residential area of Thuong Thoi Hau B commune, the head of Chin Hue canal, two crowded residential areas, the paddy fields
3	Roc Nga Tu Station	1204178.984	524369.24	Thuong Phuoc 1	Located on the East bank of Suon 2 canal, surrounded by paddy fields
4	Don Ganh Station	1203387.338	524907.921	Thuong Phuoc 1	Located on the East bank of Suon 2 canal, surrounded by paddy fields
5	Repair of Bay Den Station	1202653.801	526276.526	Thuong Phuoc 1	Located on the East bank of Suon 2 canal, surrounded by paddy fields
6	Bay Ngoi station	1203462.751	527792.402	Thuong Phuoc 1	Located on the West bank of Dia Cat canal, surrounded by paddy fields, there are 2 households living about 30m far from the station
7	Bay Xe Station	1199625.167	533830.507	Thuong Thoi Hau B	Located on the north bank of Tu Thuong canal, surrounded by paddy fields
8	Hai Thuoc Station	1201618.174	530975.351	Thuong Thoi Hau A	Located on the west bank of the Coi Tieu canal, surrounded by paddy fields
9	Coi Dai Station	1202725.693	531887.471	Thuong Thoi Hau B	Located on the south bank of the Coi Dai canal, surrounded by paddy fields
10	Xeo Chon Station	1200137.851	536646.805	Thuong Thoi Hau B	Located on the north bank of Ba Chanh canal, surrounded by paddy fields, 200 m from the So Thuong River
11	Ba Tuong Station	1199894.698	535101.227	Thuong Thoi Hau B	Located on the east bank of Cau Muong canal, near the culvert has 3 households raising fish, the inside is the paddy field
II Hong Ngu Commune					
1	Kenh Cut Station (K10, Binh Thanh)	1204676.957	540862.968	Binh Thanh	Located on the west bank of Thong Nhat canal, 300 m away from the border station, surrounded by paddy fields
2	Ong Toi Station (K1, Tan Hoi)	1201570.345	538952.646	Tan Hoi	Located on the west bank of So Ha river, near the station has two HHs, surrounded by paddy fields
3	Bau Chua Station (K9, Binh Thanh)	1202319.399	540755.94	Binh Thanh	Located on the southern edge of Muoi Do canal, surrounded by paddy fields
4	Ca Ro + Sam Sai Station (K8, Binh Thanh)	1200981.928	540947.693	Binh Thanh	Located on the south bank of the Sam Sai canal, near the station is a few HHs raising blue crayfish, and fish farming, the inside is paddy fields.

No.	Items	Coordinate system VN2000, meridian axis 105°00, Projection 3°			Description of surroundings
		X (m)	Y (m)	Commune	
5	Ong Chieu Station (K3 + Binh Thanh)	1200270.104	542691.206	Binh Thanh	Located on the East bank of Binh Thanh 2, near the National Road 30, a few HHs raising pangasius, surrounded by the paddy field.
6	Bay Phuoc Station (K2, Binh Thanh)	1199558.949	543005.848	Binh Thanh	Located on the west bank of Binh Thanh 2, surrounded by paddy fields, 200 m away from the other side, there are two HHs raising pangasius, surrounded by paddy fields.
7	Ut Le Station (K2, An Binh A)	1192354.639	542334.07	An Binh A Commune	Located on the northern bank of Muong Lon canal, surrounded by paddy fields
8	Nam Trieu Station (K2, An Binh A)	1192541.21	543118.78	An Binh A	Located on the northern bank of Muong Lon canal, surrounded by paddy fields
III Tam Nong District					
1	West bank Station of An Long 2 (Compartment No.5 An Hoa)	1187290.171	544699.312	An Hoa	Located on the west bank of An Long 2, surrounded by paddy fields
IV Thanh Binh District					
1	Ho Dau Station (the east bank corner of Duong Gao Gao canal - Khang Chien canal)	1175434.02	552641.43	Phu Loi	Located on the south bank of Duong Gao canal, surrounded by paddy fields, 50 m from the opposite side of the canal is Phu Loi Secondary School

2.1.2. Infrastructure system and services

2.1.2.1. Transportation

The transportation network in the subproject area has been continuously developing. Especially, the rural transport system has created a new movement in rural areas.

a). Road traffic

The road network consists of 2,651 km of roads, the density per unit area is low (0.79 km/km²), but due to population density, the road density per head is high (1.60 km/1000 inhabitants and 30.5 m²/person).

- National highway (NH):

- NH. 30: 130 km long, along the banks of the Tien River from An Thai Trung (Tien Giang) to the city Cao Lanh and Ba Palace.
- NH. 54: from Vinh Long to Lap Vo town, NH. 80 from Vinh Long via Sa Dec to Kien Giang. Provincial roads have formed a network connecting urban centers to each other.

- NH. 80: starting from NH.1A (south of My Thuan old ferry), running along Tien river, Lap Vo channel, Cai Tau town, Sa Dec town, Lai Vung town, Lap Vo to Vam Cong ferry (NH.54 in Binh Thanh).
- Provincial roads: The provincial road (PR) network runs through the subproject area of about 400km, including roads: 841, 848, 850, 849, 851, 852, 853, 854. More than 100 district and inter-commune routes with a total length of more than 1000km. Distribution of traffic space is unreasonable in the north - south direction in the Plain of Reeds.
- Inland traffic: In-field roads are not developed due to flooding. Currently, inland fields are mainly land-based trails, some of which are covered with rocks that are only accessible during the dry season but completely inundated in flood season. It is very difficult for people to travel in flood-prone areas and unsafe to navigate due to high flow velocity in the flood season (*Figure 2.1*).

Figure 2.1: In-land transportation in the subproject area – southern bank of Duong Gao canal

Based on the survey result of the ESIA consultant during the preparation of the report, there have 15 bridges along canals of Khang Chien, Khang Chien 1, Hong Ngu - Tam Nong, Tam Nong - Thanh Binh and Ca Cai. 5 out of 15 bridges are new reinforced concrete bridges with clearance elevation of 10m, located on the National Highway along the horizontal canals. The distance between these bridges is about 10m. The remaining 14 bridges are mainly wooden and iron bridges with clearance elevation of 5-7m, located along the Khang Chien canal (*Figure 2.2*). With these clearance elevations of bridges, vessels, barges of an average of 50-100 tons can pass through.

b). Water navigation

There are two large river ports, Tran Quoc Toan and Sa Dec, which are located on the Tien River to meet the demand for transportation of goods (previously only one Tran Quoc Toan port).

Dong Thap has a very diversified and convenient waterway system, which connects two tributaries of Tien and Hau rivers. The local-managed waterways including 9 rivers with 152.7km long; 275 canals with 2,080km long and 48 creeks with 282.7 km long (*Figure 2.1*).

In the subproject area, there are flood drainage canals such as Hai Thang Chin, Khang Chien, and Thong Nhat. There are also horizontal canals such as Tan Thanh - Lo Gach, Vinh Hung - Hong Ngu, Dong Tien, An Phong - My Hoa, etc. are major canals for transportation of big vessels, boats of 150-1,000 tons. In the field, the means of transporting agricultural products

and production equipment are mainly small vessels, ranging from 3 to 10 tons (2-3m wide and 5-10m long). See details in *Figure 2.3*.

Figure 2.2: Bridges along the canal dredging route of the subproject

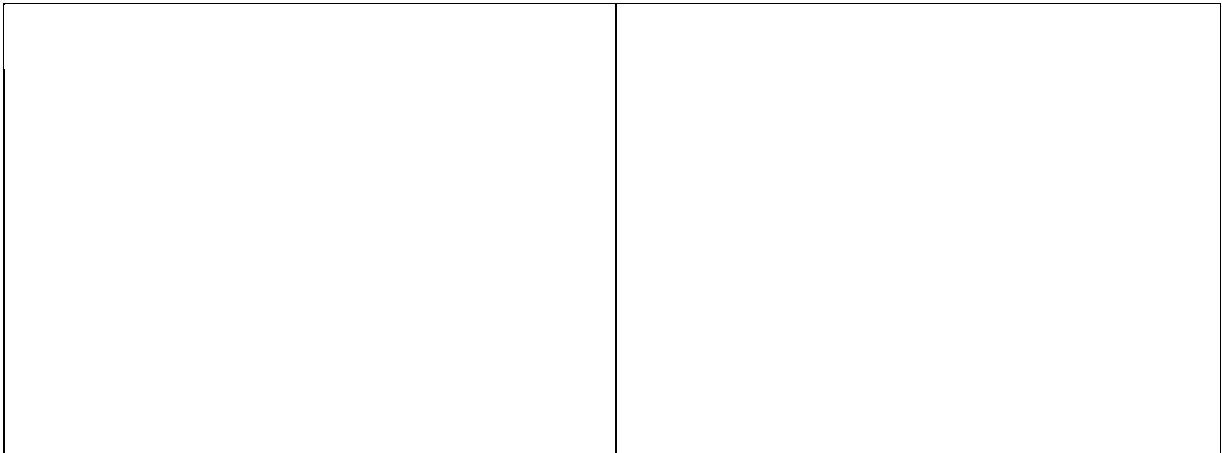


Figure 2.3: Boats traveling in the subproject area (a) in-field canals; (b) in horizontal canals

2.1.2.2. Current status of water resources system

The water resources system in Dong Thap province includes canals, flood control embankments, irrigation culverts, electric pump stations, oil pumps, etc. which basically meet the requirements of agricultural production, shrimp and fish farming, etc. contributing to population distribution, combining waterway transport:

a). *Canal system*

For decades, the irrigation system has brought great effects on the development of agricultural production such as soil reclamation, crop transfer, intensive farming, population distribution, supply water for domestic use and completing inland and waterway transportation system, creating conditions for the development of economy, culture and society, but the infrastructure is still having limitations as in *Table 2.6*.

Table 2.6: Existing irrigation works in the subproject area

No.	District/town	Total	Axis canal/primary and secondary canals (route)	Sluices and culverts (item)	Electrical pumping stations (item)
1	Hong Ngu district	201	8	104	89
2	Hong Ngu town	216	13	151	52
3	Tam Nong district	516	48	341	127
4	Thanh Binh district	381	35	168	178
	Total	1,795	204	990	601

Source: Dong Thap Water Resource Department, 2016

b). *Flood control embankment*

In the four subproject districts, there are 144 compartments surrounded by embankments to protect people's life and production, with a total protected area of 72,363 ha, the total length of 1,656 km. The elevation is from +1.0 to + 6.5 m, the width is from 1.0 m to 25 m (*Table 2.7*). Some prevent-flood roads have combined with rural traffic, but most of them have not met the requirements of motorized vehicles, intra-field traffic for mechanizing agricultural production, large-scale production nor new rural criteria.

Table 2.7: Current status of embankment system

No.	District	Number of compartments	Serving area (ha)	Length (m)	Dimension (m)	
					B _{surface}	Top elevation
1	Hong Ngu district	16	11,395	193,364	2 ÷ 25	+(1.5 ÷ 6.4)
2	Hong Ngu town	25	9,051	232,710	2 ÷ 20	+(2 ÷ 6.5)
3	Tam Nong district	52	29,664	675,685	2 ÷ 8	+(2.5 ÷ 5.2)
4	Thanh Binh district	51	22,253	553,921	1 ÷ 14	+(1.5 ÷ 5.0)
	Total	144	72,363	1,655,680		

c). *Irrigation and drainage sluice/culvert*

By 2016, there are 764 culverts in the 04 subproject districts/town. The number of sluices and culverts has contributed greatly to the improvement of irrigation and drainage condition, to better serve the requirements of agricultural production. However, the operation of the sluice system is mainly manual and not synchronous. So, the effect is limited (*Table 2.8*).

d). *Electric pump station*

According to the project of developing electric pumping stations in Dong Thap province up to 2020 approved by the PPC in Decision No. 439/QĐ-UBND.HC dated May 19, 2014. In the 2016-2020 period, 274 electric pumping stations will be built, and the service area will increase by 25,446 hectares, bringing the total agricultural acreage up to 203,494 hectares, equivalent to 94% of the cultivated area in 2015.

The actual development shows that Dong Thap province has 180,749 ha/216,868 ha of agricultural production area which was actively irrigated/draind by an electric pump, raising the rate of service area by the electric pump to 83% with the total 1,008 stations, up 306 stations compared to 2009. The remaining areas are mainly irrigated and draind by oil pumps and gravity irrigation (Table 2.9).

The scale of the service area of an average pump station is 180ha, the districts of the Plain of Reeds from 140 to 200 ha; The area between the two rivers (Lap Vo) is 60 - 120ha. Most of pump stations are makeshift and semi-solid without suction tank nor discharge tank; pump support system and equipment are made by people to fit the location; pump house and management mainly built by bamboo leaves and iron.

Table 2.8: *Current status of inlet and outlet structures*

No.	District/town	Open culvert				Underground culvert				Total
		Serving area	Scale of works			Serving area	Scale of works			
			Number	(BxH)	Bottom elevation		Number	(BxH)	Bottom elevation	
				(ha)	m			m	(ha)	
1	Hong Ngu district	21,241	30	2.0x5.0	0	1,725	74	1	0,5	104
2	Hong Ngu town	13,919	35	2.0x4	0	2,650	116	1	0,5	151
3	Tam Nong district	14,543	57	1.5x4.5	-0.5	25,189	284	1	0	341
4	Thanh Binh district	9,139	22	3.0x5.0	-0.5	6,112	146	1	0	168
	Total	58,842	144			35,676	620			764

Table 2.9: *Current status of electric pump stations*

No.	District/town	Number of stations	Number of pumps	Type	Total volume	Voltage transformer	SA	In which			
				(m ³ /h)	(m ³)	(KVA)	(ha)	Irrigation		Drainage	
								Number	SA (ha)	Number	SA (ha)
	Total	446	856	0	1,179,900	42,915	73,195	444	68,395	2	4,800
1	Hong Ngu district	89	157	700-2000	256,500	6,825	14,063	88	11,063	1	3,000
2	Hong Ngu town	52	109	700-2000	187,900	5,040	8,762	52	8,762		
3	Tam Nong district	127	265	1400-2000	392,000	16,965	25,906	127	25,906		
4	Thanh Binh district	178	325	600-1200	343,500	14,085	24,464	177	22,664	1	1,800

Note: SA: serving area

2.1.2.3. Services, communication and clean water

a). Electricity, communication and clean water

At present, clean water system does not entirely cover the subproject area. According to statistics, in 2017, the percentage of households living in the subproject districts/town using safe water was 91.56 to 97% of total households. DPCs direct specialized offices and communes/town to check and propose to handle the urgent problems that people are concerned about. In the subproject districts/town, the percentage of HHs using the national electricity grid is from 99.5 to 100%.

In addition, the medium voltage power grid in the subproject area has basically been invested and developed to the subproject communes, there are 7/39 pump stations with medium voltage lines available for use, details are in *Table 2.10*.

At the central of communes, waste is collected to a centralized disposal site of the commune. The waste from other areas is not treated. There is no centralized wastewater drainage system wastewater from domestic and production is discharged directly into rivers and canals.

Table 2.10: Existing medium voltage lines in the subproject area

No.	Locations and figures	Note
1		The medium-voltage line along Duong Gao canal where Ho Dau pump station will be built
2		The medium-voltage line along An Phong-My Hoa canal. This is the construction area of Ca Gao sluice
3		The medium-voltage line along Thong Nhat canal where sluices combined pump stations of West bank of Thong Nhat canal (Compartment No.13), Ong Nhon, Kenh Cut, Dia Sinh will be built

No.	Locations and figures	Note
		The medium-voltage line along Dong Tien canal where build the sluice and pump station of North Dong Tien (compartment No. 13 and 14)
4		The medium-voltage line along An Long 2 canal where the sluices and pump stations of Phu Ninh, An Long and An Hoa will be built.
5		The medium-voltage line along Khang Chien canal where Cu Lao Chim sluice and pump station will be built.
6		The medium-voltage line along Muong Lon creek where the sluices and pump stations of Ut Le, Nam Trieu, Kho Be and Tau Quoc will be built.
7		The medium-voltage line along canals of Binh Thanh 2, Sam Sai and Muoi Do and So Ha river where the sluices and pump stations of Bay Phuoc, Ong Chieu, Ca Ro, Ong Toi, Ong On, Bau Chua will be built.

No.	Locations and figures	Note
8		<p>The medium-voltage line along rivers of So Thuong and So Ha, the border patrol road, and canals of Tu Thuong, Suon 2, Dia Cat and Cau Muong where the sluices and pump stations (Roc Nga Tu, Don Ganh, Bay Den, Bay Ngoi, Muong Vop, Muong Hau, Chin Hue, Dau Ca Cat, Nam Mung, Cay Dua, Xeo Chon, Sau Quang, Ba Tuong, Hau Ca Cat, Hau Bau Goc, Hai</p>

No.	Locations and figures	Note
		Thuoc and Coi Dai) in communes of Thuong Thoi Hai A, Thuong Thoi Hau B and Thuong Phuong 1 will be built.

b). Medical care and health

In the subproject area, there are 54 adequate health services such as commune health stations, district hospitals, clinics, pharmacies... with a common radius of 1-5 km. Total employer of the medical station is 1073 staffs, including 220 medicine doctoral, physician: 316, nurse: 240, health-care aide: 144, pharmacist: 153 (*Table 2.11*). People can easily choose medical treatment centers, most of which are commune health stations, followed by district hospitals to treat some common diseases. During construction, nearly a hundred workers will be

mobilized per day. With such an infrastructure of health service, first aid and simple disease can be cured.

Table 2.11: Number of medical staffs and health care station in the subproject districts/town

No.	District/town	Health care stations	Doctors (people)	Physicians (people)	Nurses (people)	Health-care aide (people)	Pharmacist (people)
1	Hong Ngu district	14	36	79	29	27	40
2	Hong Ngu town	9	67	70	80	38	32
3	Tam Nong district	14	54	78	62	34	40
4	Thanh Binh district	17	63	89	69	45	41
	Total	54	220	316	240	144	153

Source: Statistical yearbook of the subproject districts/town in 2017

Common illnesses include cold, flu, respiratory, hepatics, dengue fever, due to the characteristics of tropical climates and high rainfall easily lead to disease outbreaks (*Figure 2.4*).

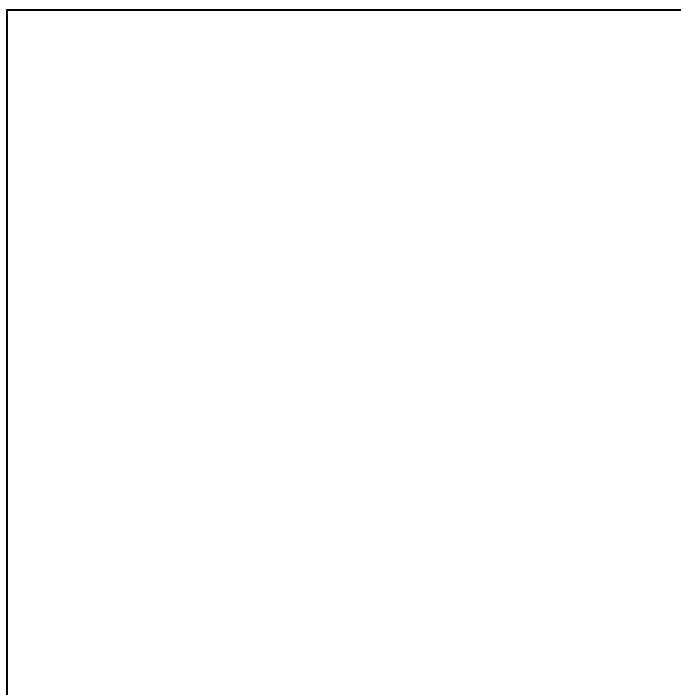


Figure 2.4: Some common diseases in the subproject area

2.1.3. Geology and topography

2.1.3.1. Topographical characteristic

The terrain has relatively flat. The main slope direction is from the Northwest to the South East, high in the border areas and along the Tien River, lower towards the center of Plain of Reeds, forming the lowland valley. The elevation is from 0.90 to 1.30 m, the highest is 1.67m, the lowest is 0.67m (*Figure 2.5*).

Figure 2.5: Topography map of Dong Thap province

2.1.3.2. Geological characteristic

The geological development history of Dong Thap province in general and the areas of 4 districts in the North Dong Thap in particular, is the same as in the Mekong Delta, with the formation of ancient sediment (Pleistocene sediments) and New sediment (Holocene sediment) through deposition of sediments of the sea and the Mekong river.

- Ancient sediment (Pleistocene sediments, Qm): distributed along the Vietnam-Cambodia border (Tan Hong) and sank under new silt. In Tam Nong district and north of Thap Muoi district, ancient sediment is very shallow, a few meters underground or exposed above the ground as mounds. Ancient alluvium slab clay can be used in the production of low-grade ceramic and tiles.

- New sediment (Holocene sediments, QIV): formed during the transitional period and back from about 6,000 years ago to date. Materials include gray, blue or brown clay and sand. The new sediment consists of two structures: the grayish clay layer beneath and the freshwater or brackish water deposits above it, forming a weak base on the surface of a thickness of 20-30m. The new sediment is rich in organic matter, has a higher natural moisture content than the flow limit and has low mechanical values. New alluvial layers with an average compressive strength of 0.24 to 0.7 kg/cm², the aggregate force 0.10 - 0.29 kg/cm², are weak soils suitable only for the development of various types low-rise building.
- In general, the terrain of Dong Thap province is flat, suitable for the implementation of constructions serving the production and transport development. However, because the region has many canals so it costs a big budget for bridge construction; Weak ground requires expensive foundation reinforcement, especially for high rise buildings.

2.1.3.3. Soil condition

The characteristics of the main soils in Dong Thap are as follows:

- Alluvial soil accounts for 35% of the total area of the province. It is distributed along the Tien River with abundant water resource for irrigation, which is suitable for diversification of crops.
- Acid soils account for 34%, but only 21% (23,359 ha) are acid sulfate soils, which are used in Melaleuca plantation, the majority of which are acacia (deep acidity layer) used for rice cultivation with high productivity, but the degree of diversification of crops is much more limited than alluvial soil.
- Soil for bedding covers about 17% of the total natural area, of which about 30% is residential land, the remaining area is used for perennial crops, mainly fruit trees.
- Gray soil accounts for about 8% of natural area, although the fertility is not high, but quite suitable for growing vegetables - crops.

Majority of the land area of Dong Thap is good soil type, favorable for intensive cultivation to increase productivity and reduce the price of many crops compared to many other regions in the Mekong Delta as well as the whole country.

As shown in *Figure 2.6*, the subproject area is mainly sediment (about 70%), concentrated along the Tien River so it is very favorable for the development of the subproject. Only about 25% is alum soil, mainly alkaline soil, is located in An Binh B commune (Hong Ngu town) and Phu Thanh B, Phu Tho communes (Tam Nong district). Therefore, the construction in these communes should be carefully carried out.

2.1.4. Climate and meteorology

The subproject in particular, Dong Thap province, in general, is in a tropical monsoon climate, hot and humid; quite stable during the year. Every year the climate is divided into two distinct seasons corresponding to two monsoon patterns: the rainy season from May to November and the dry season from December to April. In the rainy season, rainfall accounts for 80-85% while in the dry season, rainfall only accounts for about 15 - 20%.

Figure 2.6: Map of soil in Dong Thap province

Temperature: The monthly average temperature varies from 27.0 - 27.5°C. The variation between months is not large (about 4°C). April has the highest average temperature (nearly 29°C). January has the lowest average temperature (over 25°C). See *Table 2.12* for details.

Humidity: The average monthly humidity is 80-85% and varies with the season. It reaches the highest in the rainy season (June, August, September). The lowest is in February, March and December (*see Table 2.12*).

Table 2.12: Monthly average temperature, humidity in Dong Thap in 2010 – 2015 (°C)

Parameter	Monthly average												Yearly average
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
Temperature (°C)	25,2	25,9	27,7	28,7	28,9	28,2	27,7	27,8	27,5	27,7	27,7	26,4	27,4
Humidity (%)	84	82	79	81	83	85	85	85	86	85	84	83	83

Source: Statistical Yearbook of Dong Thap, 2015

Evaporation: varies from 909.8 to 1,037.8 mm, the average is 983.7 mm. It is also the average of the Mekong Delta. There are differences between the two seasons, ranging from 66.7 mm to 79.9 mm in the rainy season and from 76.1 mm to 108.5 mm in the dry season.

Rainfall: The region has average rainfall in the Delta, ranging from 1.392 to 2.388 mm. It distributes unevenly according to the seasons of the year. The rainy season is from May to November, accounting for 90-92% of the total rainfall, concentrating in September and

October. However, in late July to early August, only a small amount of rainfall is observed (Table 2.13).

Table 2.13: Monthly average rainfall in Dong Thap province, period 2010 – 2015 (mm)

Year	Month												Yearly average
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
2010	29.8		1.2	70.4	89.6	141	367.9	386.7	383.8	512.5	333.8	71.1	2387.8
2011	19.1		71.7	20.6	148.9	287.9	163.7	210.7	148.1	205.8	279.5	108.1	1664.1
2012	1.5	0.6	30.1	110.4	167.7	106.5	213	123.1	189	236	116.1	15	1309.0
2013	7.8	4.3		69.2	120.7	204.2	128.3	223.5	362	218.8	150.2	32.7	1521.7
2014	0.5		0.3	164.7	111.9	189.9	63.3	80.6	100.2	308.5	123.8	35.3	1179.0
2015	1			44.2	60.6	193.4	103.4	81.3	217.6	175.2	187.7	26.9	1091.3
Monthly average	10.0	0.8	17.2	79.9	116.6	187.2	173.3	184.3	233.5	276.1	198.5	48.2	1525.5

Source: Statistical Yearbook of Dong Thap, 2015

Wind: The subproject area has two main wind directions: North East (from November to April) and Southwest (from May to October). The wind speed is generally not high (mean 1.0 to 1.5 m/s, average maximum of 17 m/s). Due to deep inland, strong winds are usually from west to southwest.

Sunshine: The subproject zone is relatively sunny, about 2,500 hours/year and about 6.8 hours/day. It tends to decrease in the direction northeast - southwest. High sunshine in the middle of the dry season, the average hours of sunshine are 7.6 - 9.1 hours per day. It is less sunny in the rainy season, about 5.1 to 7 hours per day.

2.1.5. Hydrology and river system

2.1.5.1. River network in the subproject area

The subproject area has a dense canal system consisting of natural and manual canals as follows:

Tien River: The average width of the river is about 900m; bottom elevation is -15m, particularly in My Thuan bridge, it is quite deep, -38m. In further upstream, the river carries 77-78% of the flood in the main river. When crossing Vam Nao, it is redistributed to about 51 - 52% for the Tien River and 48 - 49% for the Hau River. The river flows through Dong Thap province, about 123 km length from Hong Ngu to Chau Thanh.

Hau River: The length of Hau River belonging to Dong Thap province is 40km, also in the northwest-southeast direction from Lap Vo to Chau Thanh. The width is from 1.2 to 2.0km, and from -18 to -35m deep. There are islands along the river but they do not belong to Dong Thap province.

These two rivers are the branches of the Mekong river. They are the main water source of a large region, including Dong Thap.

Hong Ngu River: It is the last section of So Thuong River, which is the best drainage channel of the entire Vietnam - Cambodia border area, including rivers So Thuong and So Ha and the whole valley stretching along the border. The river is quite large, about 135 m width and -14

m depth in the flood period in Tan Hoi. At the gateway at Hong Ngu canal, the depth reaches -17 m. In contrast, the depth decreases sharply toward the border, from -8 m to -5 m. The river bed is pretty complex and marshy due to the accretion of sediment. The maximum flow across the River in the 1996 flood was $1,880 \text{ m}^3/\text{s}$ with total drainage of $7.49 \times 10^9 \text{ m}^3$.

- So Thuong river is the main branch of Hong Ngu river, pouring water from the west. The width ranging from 120 - 60 m (from the border), the bottom elevation is about -10 m.
- So Ha river is the eastern branch of the Hong Ngu River, with an average width of 45m and 20m depth; The bottom elevation is $\geq -4.17\text{m}$ (the first section of the canal of Doi Ha - Cai Co).

Ca Cai canal: It is a natural canal, connected to TraBek river in Cambodia and runs directly to the central part of the Plain of Reeds. This is a large canal with a width of 115m; bottom elevation from -3 to -5 m. Due to being connected upstream, Cai Cai canal receives a large amount of water. During flood season, the flow rate in the canal is about $100 \text{ m}^3/\text{s}$. Therefore, it plays an important role in flood control in the Plain of Reeds.

2.1.5.2. *Horizontal axis canals*

Besides vertical axis canals, the Plain of Reeds has dense horizontal canal system (North-South direction), which distributes irrigated water, contributes to acidification, soil reclamation and even flood distribution to the gateways along the Tan Thanh - Lo Gach.

The area directly affecting the amount of flood from the border into the Plain of Reeds is the northern strip, stretching from the Tien River, including Hong Ngu and Tan Hong districts through Tan Hung, Vinh Hung, Thanh Hoa districts and Duc Hue (Long An province) with the main horizontal canals:

- **So Ha - Cai Co Canal:** The canal connecting to So Ha River runs to Binh Tu, Long An Province, 66km long. In which, 34km located in Dong Thap province (bottom width = 20m, bottom elevation = - 4.17m); remaining section (bottom width = 10 m, bottom elevation = -3.17m). It has been invested in dredging and upgrading on the southern bank, supplying water (about $1.7 \text{ m}^3/\text{s}$ -dry season, in Thong Binh) and regulating the overflow from the border into Plain of Reeds.
- **Tan Thanh - Lo Gach Canal:** 51.4km long, connected to the Hong Ngu River. The first section is the old Sam Sai canal so it is not straight. Reaching Binh Thanh, the canal is straight with a bottom width of 24 to 16m, bottom elevation from -4.17 to -3.17m. As an important canal for irrigation and re-connected to the vertical canal system, Tan Thanh - Lo Gach canal is also responsible for distributing flood to the exit. In the future, the canal is expanded to meet the needs of irrigation and contribute to the reducing salinity of the Vam Co river system.
- **Hong Ngu Canal:** beginning at Tien River and ended at Ram Rung canal (connected to Vam Co Tay river). The canal is 42km long, bottom width = 40m, bottom elevation - 4.17m. It has a great effect in irrigation and flood drainage for the northern part of the Plain of Reeds. Over the years, Hong Ngu Canal has contributed significantly to the socio-economic development of the region. The 28m length of the canal passes through Dong Thap province, from Hong Ngu Town to Phuoc Xuyen Canal.
- **Dong Tien - Duong Van Duong Canal:** The canal connects to Tien river in An Long commune, Tam Nong district in West – East direction. The section from Tien river to

Phuoc Xuyen canal called Dong Tien canal, from there to Canal 12 is Duong Van Duong, the last segment is called Lagrange. The bottom width is 20m; Bottom elevation is -3.17 to 3.67m.

- **Nguyen Van Tiep Canal:** This is a large canal, running from Tien river at Phong My estuary and connecting with Vam Co Tay supporting waterway transportation and trade, the channel has bottom width = 20 m; bottom elevation = -3.17 to 3.67 m.

In addition, there are other canals such as An Binh, An Phong My Hoa-Nam Ngan-Bac Dong, Duong Thet-Can Lo Canal, and Canal No.1 to create water sources for the Plain of Reeds.

The distribution of axial canals has guaranteed a distance of 8 to 10 km/canal. The axis of Phuoc Xuyen canal parallel to the Tien River and has the same function as the axis canal.

In the dry season, the horizontal canals intake water mainly from Tien River and northern vertical canals. In between these channels are natural rivers and canals, including important creeks such as Ba Rang, Doc Vang Thuong, Doc Vang Ha, Cai Dau, Cai No, Binh Thanh, Tan Cong Chi, Phu Duc, Phu Hiep, Duong Thet Trong, Cai Beo, 307, etc.

2.1.5.3. Hydrology characteristic

Located in the Lower Mekong River, the hydrological regime of Dong Thap province is influenced by the hydrological regime of Tien and Hau river, the East Sea tide, the regional rainfall regime; Vam Co river system also brings certain effects. The sub-project area has a hydrological regime in dry season and flood season as follows:

a) Hydrological regime in the dry season

Dry flow is directly affected by Tien, Vam Co Tay rivers and other factors. Under the impact of the tide, water enters the canals of Tan Thanh, Hong Ngu, Dong Tien - Duong Van Duong, Can Lo into fields, creating higher water level on Tien river, from Cao Lanh upward than the level in fields and Vam Co Tay, even in the driest month (April).

During dry season, tide peak gradually decreases from Tien River into canals and to Vam Co Tay river; 138 cm at An Long 138 cm, Hong Ngu 125 cm, Tram Chim 84 cm, Hung Thanh 69 cm, Kien Binh 61 cm, in February; and, in May, at An Long 112 cm, Hong Ngu 99cm, Tram Chim 56cm, Hung Thanh 48cm, Kien Binh 44cm. The 15-day flow measurement at the end of April and early May shows that inflow from Hong Ngu is 17.27m³/s, An Long 9.01m³/s, Doc Vang Ha 2.01m³/s, Phong My 9.53m³/s.

The main water supply for this area is from Tien river, through the main canals connecting Tien river and Vam Co Tay river. Canals of So Ha – Cao Co, Tan Thanh-Lo Gach and Hong Ngu are the three main axes that provide water for the central and eastern areas of the Plain of Reeds.

During the driest period, in the first stage (in 1997), the average flow of one tide period from Tien River to the two canals is 19m³/s; In the later stage (2001), the average flow of one tidal wave was 42.5m³/s (about 2 times higher). The southward is the stronger influence of the East sea tide on the flow from rivers. The average tide in the mid-dry season only reached 4 - 8m³/s.

b) Hydrological regime in flood season

Flood on main rivers:

The Mekong river has an annual water volume of about 475 - 500 billion m³, of which the total water volume in the flood season (June-November) accounts for nearly 90%.

Flood events in submerged areas in the MD in general, Dong Thap province, in particular, depends on flood peak, volume and type (height, peak time and duration); depends on the ability to lead water into fields and flood drainage; and, depends on tide and inland rainfall.

From July to November every year, floods on Tien and Hau Rivers are formed due to rainfall in the upper Mekong and regional rainfall. Compared with upstream, the floods occur and end usually over a month later. The largest flow on the Tien River in My Thuan is about 16,000 - 18,000 m³/s, on the Hau River in Can Tho 21,000 m³/s.

Floodwater flows into the Plain of Reeds in two directions: (a) from the Cambodian floodplain through So Ha - Cai Co canal, which accounts for 75 - 80% (called spill-flood); and (b) from Tien river follow canals of Tan Thanh - Lo Gach, Hong Ngu, Muong Lon, An Binh account for 24% ÷ 25% of total flood waters entering the Plain of Reeds. This amount of water runs to Tien river mainly through Highway 30 from the Phong My to An Huu and crosses Highway 1 from Co Co to Long Dinh, partly to two Vam Co rivers.

Inland flood:

Flood in the Plain of Reeds is caused by upstream flood of the Mekong River, tides in the East Sea, inland rainfall, topography, geomorphology, river network, traffic roads and other human activities.

Flooding level depends on space and time in flood season. The inundation diminished in the direction of Northwest - Southeast. Flood depth and duration are different from year to year.

At the end of July, beginning of August, while the water level in Tan Chau remains at 3.0 m and if high tide occurs, a blockage will cause inundation in the places near rivers and creeks, the flood events in 1978 and 1984 typically. In general, the flow is in the direction of West - East through the channels of So Ha - Long Khot, Tan Thanh - Lo Gach, Hong Ngu, Dong Tien to transfer water into the Plain of Reeds and drain to Vam Co Tay river.

The beginning of flood season is the best time to absorb acid and alkaline water.

Previously, when the water level of Tien River began to rise, water flows mainly in vertical axis canals into the Plain of Reeds. In early July and August, when the water level at Tan Chau up to 3.0m, water overflows the left bank of So Ha canal until the high flood, this overflow hinders the flow from Tien river. Flood water in the Plain of Reeds is drained in two directions:

- The South back to Tien river from Thanh Binh to My Tho.
- The East flows to Vam Co Tay River, Vam Co Dong flows to East Sea.

As the water level in Tien river begins to rise, flood through the canal systems overflows into the Plain of Reeds in both directions west and north. In the west, flood water along the west-east channels enters the fields. On the north side of the So Ha canal, flood water runs in the channels from the border into fields as soon as the water level begins to rise, not until the Tan Chau water level reaches 2.50 m as before. This causes the water level in the interior of the Plain of Reeds in July and August to rise, such as the average water level in July and August

in 1991-1994, in Moc Hoa is higher than in 1984-85 at 0.25- 0.35 m. Although the level Tan Chau in 1991-1994 was about 0.35 - 0.40 m lower than in 1984 - 1985.

The drainage capacity of each channel is different, but the direction toward the west and the south is stronger than the east. Total discharge to the west (through National Highway 30) is $2,158\text{m}^3/\text{s}$, about 9.3 billion m^3 of water; through Highway I in the south: $2,157\text{m}^3/\text{s}$ about 10.8 billion m^3 . The discharge to the West (Tan An): $1,700\text{m}^3/\text{s}$, about 10.2 billion m^3 . The gates of Can Lo, Thong Luu and Co Co are the largest outlets in the south. The drainage capacity of the channels linking Tien River and Vam Co Tay river to West-East direction such as Dong Tien - Lagrange, Nguyen Van Tiep A, etc. is poorer because it depends on the drainage capacity of Vam Co Tay river.

Flood depth and duration

Flood depth and duration varies from one place to another place, in the north of the province (on the road to Tan Hong), including So Thuong and So Ha to Tan Chau when the flood is blocked by the N1 route, so flooding occurs sooner than usual from August, with the depth of over 2.5 m. At the beginning or the end of December, flood starts to drain, the duration of flooding lasts more than 4 months.

From Hong Ngu canal down to Nguyen Van Tiep canal due to the dyke of Hong Ngu, An Long, Nguyen Van Tiep the flow is blocked and flooding time slows down. At the end of September, the area is inundated until late December/early January, flooding duration is about 3 to 4 months, the depth is over 2.5m in the upper part and over 2m in the downstream.

The south of Nguyen Van Tiep canal, between the Tien and Hau rivers due to the strong influence of the tide, should be better drained. Flood depth is around 1.0 m - 2.0 m, submergence time less than 3 months.

As shown in *Figure 2.7*, flood in 2000 in the subproject area causes the greatest flood depth of 2.5 to over 4 m. The abundant flood water is also a favorable factor and perfectly suited to the purpose of the sub-project is to make use of flood water to increase livelihood and improve income for people in upstream.

Figure 2.7: Map of maximum flood depth distribution in 2000

2.1.6. Erosion in the subproject area

Districts in the subproject zone located in the upper Mekong Delta. In the rainy season, upstream flood inundated the whole area in water. Therefore, under the effect of overflows with high water velocity while dike systems are often built close to the canal bank, so the erosion occurs every year, affecting transportation, socio-economic development.

In recent years, the status of landslide in districts/town in subproject has been more complicated: in 2014, there were 40 landslide events in Hong Ngu district, in which 25 serious local-landslide cases in the communes along the Tien River; in 2015, at Hong Ngu town, there were 3 landslides of the Muong Lon canal, 400 m long, 1 m deep, and the landslide of the Thuong river is 13 m long and the most serious one is Tien river in An Lac ward with the length of 47 m, 15 m deep, causing damage to one bamboo fish farm and one fish pond; In 2016 in Thanh Binh district, 13 hamlets were landslide, the risk of landslide was 42 points with 15.545 m long (the depth at the side of Thanh Binh is 20m), the total area of landslide is about 18,065 m². The total number of households currently in the landslide belt is 1,352; in which 517 households required emergency relocation. Thanh Binh district in cooperation with communes and towns with households in the belt of landslides mobilize 36 HHs to move to a safe place; continue to relocate more away from the belt landslide.

2.2. CURRENT STATUS OF ENVIRONMENTAL QUALITY

2.2.1. Air quality

On May 5, 2017, the consultant conducted the measurement and sampling of air at 10 locations (*Figure 2.8*), detailed measurement results as shown in Appendix 3. These data serve as a basis for comparing the impact of excavation, the operation of machinery to the quality of the air environment and proposing mitigation measures.

National standards of the Ministry of Natural Resources and Environment have been used to assess the current status of the air quality:

- QCVN 05: 2009/BTNMT: National Technical Regulation on ambient air quality.
- QCVN 26: 2010/BTNMT: National Technical Regulation on noise.

The results of the air quality analysis of the subproject zone show that:

- *Noise*: Noise measurement at 10 air sampling locations in the subproject zone shows that the noise level in the area varies greatly from 36.4 to 69.4 dBA. However, the average values show that the noise level in the area is not too high, ranging from 52.3 to 61.2 dBA, according to the regulation (QCVN 26: 2010/BTNMT). The noisiest place is monitoring locations located near the canal where there are boats traveling and causing significant noise to the subproject zone.
- *Suspended dust*: The results show that in the subproject zone, the dust content in the air ranges from 34 to 65 $\mu\text{g}/\text{m}^3$ and is within the specified limits (QCVN 05: 2009 / BTNMT column 1). This indicates that the air is not contaminated with suspended dust. This result also reflects the fact that the sub-zone is located far from traffic routes and urban areas, so the source of dust is almost nonexistent.
- *NO₂ content*: NO₂ in the air is mainly derived from fuel combustion. Analysis of NO₂ content in the air at the sampling sites showed that the index only ranged from 16 to 38 $\mu\text{g}/\text{m}^3$ within the specified limits of air quality (QCVN 05: 2009 / BTNMT column 1). This shows that the air environment in the area is relatively clean and not affected by NO₂.
- *SO₂ content*: Similar to NO₂ gas, SO₂ gas in the air is also generated primarily from the burning of fuel (petrol, oil, etc.). The results of the survey (Appendix 3) show that the SO₂ content in the air is very low, ranging from 15 to 24 $\mu\text{g}/\text{m}^3$, which indicates that the air environment in the area is not significantly affected by fuel burning.

The survey results show that: The present condition of the air environment in the area is good, the content of toxic NO₂ and SO₂ is very low and always within the allowable range. Particularly, the amount of dust in the air is quite low due to limit sources. This is also a great pressure for the construction units, this unit should have solutions to control the impact of gas emissions from machinery and vehicles; dust from transporting fuel and materials as well.

Figure 2.8: Location of air quality samples in 2017

2.2.2. Soil quality

Soil is a habitat, providing nutrients for the growth of many plants and microorganisms. All methods of land use and exploitation lead to changes in the characteristics of the soil environment and indirect impacts on the water environment.

During construction, excavation work is unavoidable. This may have some impact on the environment. Accurate assessment of the land environment in the area is the basis for identifying changes that may occur during excavation as well as their impacts over time. This is the scientific and practical basis to propose reasonable solutions to overcome the construction process as well as when the system works.

Therefore, in order to assess the quality of soil environment, in May 2017, the consultant unit took soil samples at 15 sites with different depth level (the first layer is 0-20 cm, 2nd layer is 50 - 70 cm deep, 3rd layer is 1.3-1.5 m deep).

The location of soil samplings in the area is shown in *Figure 2.9* and the results of the analysis of soil quality are attached in *Annex 3*.

Figure 2.9: Location of soil samples in 2017

a). Salinity

Salinity is an important indicator in evaluating soils, especially for coastal soils that are influenced by tides. The salinity of the soil not only affects the plant but also influences the quality of the work due to the erosion of salt in the soil.

Soil salinity is assessed through the electrical conductivity (EC) of soil extraction solution. Soil salinity is also measured through the total soluble salt content in the soil and content of chloride and sulfate (SO_4^{2-}). Classification of salinity in the soil is shown in *Table 2.14*.

The results of EC values of the soil samples are shown in *Figure 2.10*. The EC values range from 149 to 1365 $\mu\text{S}/\text{cm}$; Compared to the classification criteria in *Table 2.14*, most are non-saline or slightly saline. Particularly, at positions D2, D3, D4, D5, the soil is from slightly to moderately saline.

Table 2.14: Soil salinity classes by EC

Class	EC 1:5 ($\mu\text{S}/\text{cm}$)
Non-saline	<400
Slightly saline	410–800
Moderately saline	810–1,600
Very saline	1600–3,200
Very saline	>3,200

Source: Rana Munns.

Figure 2.10: EC contents in the subproject area

b). pH value

In order to assess the acidity of the soil, $\text{pH}_{\text{H}_2\text{O}}$ and pH_{KCl} are commonly used. To classify the acidity of the soil, pH_{KCl} is often used (see *Table 2.15*).

The results show that the pH_{KCl} values at monitoring sites ranged from 3.01 to 4.71 (*Figure 2.11*). There is a great difference in pH by location and depth.

At monitoring locations (Đ2, Đ3, Đ4, Đ5), there are acid sulfate soils. The remaining positions have a slightly acidic pH.

The above data imply that the soil in the area is contaminated with alum. This is also a concern for the construction units when building a system of special works, it is necessary to monitoring and adherence to technical solutions to limit the impact on sites affected by acid sulfate to the water environment.

Table 2.15: Soil acidity classification

No	2.2.2.1.a.1.1.1 pH_{KCl}	2.2.2.1.a.1.1.2 Soil acidity level
1	< 4,0	Extremely acid
2	4,0 – 4,5	Very strongly acid
3	4,5 – 5,0	Moderately acid
4	5,0 – 6,0	Slightly acid
5	6,0 – 7,0	Neutral
6	> 7,0	Alkaline

Source: Le Van Khoa, 1996.

Figure 2.11: pH_{KCl} in soil sampling sites in the subproject area

c). Organic matter concentration

Organic matter is an important indicator in determining the fertility of the soil, the content of organic matter in soil relative to the chemical composition of the soil. The results show that the correlation between organic matter and other physical, chemical and physic-chemical parameters will determine the fertility of the soil. The organic matter content of the soil directly affects the nutrient content, the digestibility of the soil and the conditions of its absorption and metabolism.

Along with the cultivation, organic matter content in soil decreased due to the absorption of plants and the decomposition of organisms. However, the land is often replenished during the cultivation of surplus products; remnants of plants which are of great significance in returning nutrients to the soil. There are many ways to classify soil fertility. In India, it is thought that the fertility of the soil is determined by the NPK. In the MD the humus in a soil is divided into 5 groups (see *Table 2.16*).

Analysis results of organic matter in the soil at the sampling sites in *Figure 2.12* are shown that the concentration varies from 1.0% to 3.1%, the organic fertility ranges from poor to medium.

Table 2.16: Classification of organic matter in soil

No	Organic matter (%)	Class
1	< 1	Very poor
2	1 – 2	Poor
3	2 - 3	Average
4	3 - 5	Relatively rich
5	> 5	Rich

Source: Le Van Khoa, 1996.

Figure 2.12: Organic matter contents of samples taken in the subproject area

d). Total nitrogen content

Most of the nitrogen content in the topsoil is in humus, up to 80% of the protein is in the bonding structures of the organic compounds and about 50% of them are amine. Thanks to the mineralization and microorganisms, they are converted into NH_4^+ and NO_3^- through which plants can absorb the nutrient. There are many levels used to evaluate nitrogen concentration in soil. In the MD it is divided into four levels as shown in *Table 2.17*.

Analysis results (*Figure 2.13*) show that the total nitrogen concentration ranges from 0.13% to 0.29% (level average to relatively rich).

Table 2.17: Assessment of soil in accordance with the total N

No.	2.2.2.1.a.1.1.3 TN (%)	2.2.2.1.a.1.1.4 Class
1	< 0,1	Very poor
2	0,1 – 0,18	Average
3	0,18 – 0,3	Relatively rich
4	> 0,3	Rich

Source: Tran Van Chinh, 2000.

Figure 2.13: Total nitrogen contents of samples taken in the subproject area

e). Heavy metal

The analysis result of soil samples shows that the subproject area is not contaminated by heavy metals. The heavy metals index is very low compared to the permitted limit (see *Appendix 3* for details).

2.2.3. Sediment quality

To assess the status of the sediment quality, the consultant took 15 samples to assess the sediment quality in May 2017. (*Figure 2.14*)

Analysis results of sediment quality in the subproject as shown in *Table 2.18*, pH value of soil samples in the subproject area show that the pH values at the monitoring sites ranged from 4.94 to 5.66. Comparison with soil/sediment classification indicates that sediment in the area is slightly acid. As such, during dredging, attention should also be paid to the dredging process as well as to the dredged sludge disposal areas to minimize the impact of alum from sediment.

For heavy metals, heavy metal content in sediments is within the standard of QCVN 43:2012/BTNMT on the concentrations of heavy metals in freshwater sediments.

Figure 2.14: Location of sediment samples in 2017

Table 2.18: Analysis results of the sediment samples in the subproject area

No.	Symbol	pH _{H2O}	Mn	Cd	Pb	Zn	As
			mg/kg				
1	TT1	5.66	305	0.14	32.1	118	0.30
2	TT2	5.34	273	0.11	32.6	128	0.26
3	TT3	5.37	179	0.10	30.0	129	0.37
4	TT4	5.50	182	0.12	32.2	120	0.19
5	TT5	5.46	173	0.14	32.4	118	0.11
6	TT6	5.47	203	0.08	32.6	114	0.14
7	TT7	5.52	198	0.12	34.1	141	0.16
8	TT8	5.43	206	0.11	30.2	135	0.37
9	TT9	5.41	208	0.12	32.0	137	0.33
10	TT10	5.26	219	0.16	31.2	127	0.21
11	TT11	5.23	208	0.14	32.7	138	0.20
12	TT12	5.19	224	0.10	32.4	125	0.18
13	TT13	5.21	208	0.12	29.3	123	0.16
14	TT14	4.94	215	0.11	31.9	117	0.34
15	TT15	5.71	379	0.14	32.6	115	0.21
QCVN 43 : 2012/BTNMT			-	3.50	91.3	315	17.0

2.2.4. Surface water quality

In order to assess the status of surface water, our team arranged 20 water quality sampling sites in May 2017 (see *Figure 2.15*). The results of water quality analysis presented in Annex 3 is used as a baseline to assess the impacts of the construction on surface water quality during execution as well as when the whole system is put into operation. In addition, the results are analyzed and evaluated to identify negative factors to water environment at the present time, thereby proposing and developing solutions to mitigate adverse effects.

Criteria for evaluation of surface water quality: QCVN 08-MT:2015/BTNMT – National technical regulation on surface water quality regulating the classification of surface water quality for various water use purposes:

- Column A1: Water quality for domestic water supply and other purposes, such as columns A2, B1 and B2.
- Column A2: Water quality for domestic water supply but applying appropriate treatment technology; for aquatic plant and animal conservation, or purposes of use as columns B1 and B2.
- Column B1: Water quality for irrigation and drainage purposes or other purposes with similar water quality requirements or other purposes of use such as column B2.
- Column B2: Water quality suitable for transportation and other purposes with low water quality requirements.

Figure 2.15: Water samples in the subproject area in 2017

The results of the survey and analysis show that the current status of surface water quality in the subproject area is as follows:

a). pH value

pH is important in assessing water quality as it affects most biological and chemical processes. Previous studies have shown that pH limits for plant and aquatic life develop normally in the range of 6.5 to 8.5, if the pH is lower than 6, there is a sour taste affecting aquatic plants, fisheries, fish, etc. the lower pH of water can cause death to fish, aquatic animals and plants. According to QCVN 08-MT:2015/BTNMT column A1 the pH value is limited from 6.0 to 8.5.

pH affects directly and indirectly on fish and shrimp life, influences physiological processes (changes in membrane permeability, disrupts salt and water exchange processes, affects respiratory process), growth (growth rate), nutrition (ability to food digestion), reproduction (mature, lay eggs, development of embryos). pH also affects the cell's ability to absorb O₂ and CO₂ emissions on crustaceans and mollusks. Low pH breaks down plant cell membranes and prevents the activity of certain enzymes leading to break food chains.

The analysis shows that the pH value at the sampling sites ranging from 6.41-7.14 (*Figure 2.16*), indicating that the water is completely free of alum and is within surface water quality standard (QCVN 08-MT:2015/BTNMT type A1). This is one of the favorable conditions for aquaculture, rice cultivation as well as domestic use.

Figure 2.16: pH values of water samples taken in the subproject area

b). EC value

The water conductivity (EC) is related to the presence of ions in water, which are usually salts of metals such as NaCl, KCl, SO_4^{2-} , Ca^{+2} . Electrical conductors are mainly caused by sodium chloride. For fresh water contaminated with alum, the increase of EC in water due to SO_4^{2-} , Fe^{+2} , Al^{+3} caused by the leaching of soil into the water. *Table 2.19* shows the EC value of water in the Environment Protection Authority of Australia guidelines for wastewater irrigation.

Table 2.19: Salinity classes of irrigation waters

No.	EC range ($\mu\text{s}/\text{cm}$)	Comments
1	0 - 270	Can be used for most crops on most soils
2	270 – 780	Can be used if a moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown, usually without special salinity management practices. Sprinkler irrigation with the more saline waters in this group may cause leaf scorch on salt-sensitive crops.
3	780 – 2340	Should not be used on soils with restricted drainage. Even with adequate drainage, best practice management controls for salinity may be required and the salt tolerance of the plants to be irrigated must be considered.
4	2340 – 5470	For use, soils must be permeable and drainage adequate. Water must be applied in excess to provide considerable leaching, and salt-tolerant crops should be selected
5	5470	Not suitable for irrigation except on well-drained soils under good management especially in relation to leaching.

Source: Environment Protection Authority 1991

The result shows that the EC value varies from 100 - 378 $\mu\text{s}/\text{cm}$. There is no big difference between high tide and low tide (*Figure 2.17*). The EC value is quite low, so it is suitable for

irrigation of all crops with all types of soil. This factor does not also influence the use of this water to mix concrete, and the risk of corrosion of materials.

Figure 2.17: EC values of water samples taken in the subproject area

c). Chloride concentration

Chloride is one of the important anions in water, an important indicator of salinity assessment. The chloride content in water varies greatly due to water source and salinity intrusion. Similar to the EC, chloride concentration in the subproject is not high, ranging from 14.0 to 38.0 mg/L and within the A1 threshold (250 mg/L) of QCVN08:2015/BTNMT on surface water quality.

d). DO value

Dissolved oxygen (DO) is an important parameter in assessing the quality of water. An important oxygen source of animals, microorganisms living in water. Low levels of dissolved oxygen are a noticeable sign of polluted water.

The results shown in *Figure 2.18* indicate that the DO value varies from 0.5 to 5.8 mg/l. At all sampling sites, DO values do not meet the standard of surface water quality column A2, but mainly in the standard column B2 (QCVN 08-MT: 2015/BTNMT). The low DO content clearly indicates the surface water quality in the area is polluted by organic matters.

e). BOD₅ and COD concentrations

COD and BOD₅ are two important parameters used to assess the level of organic pollution of water resource. COD is used to evaluate total organic matter in water sources while BOD₅ is used to assess biodegradable organic matter levels. When this value is high, the water is contaminated by organic matter. When it decays, oxygen deficiency occurs in the aquatic environment, which directly affects the aquatic life. Oxygen deficiency leads to anaerobic digestion, which results in toxic gases. The metabolism of organic matter also generates other pollutants such as increased levels of eutrophication.

The measurement results show that COD values in the project area vary greatly, ranging from 12.1 to 23.1 mg/l (*Figure 2.19*). Similar to the DO value, the COD values at the sampling

sites do not meet the standards for surface water quality in column A but are mainly in column B (QCVN 08-MT:2015/BTNMT). This implies that the water source is contaminated with organic matter. It is necessary to analyze pollution sources.

f). Ammonium concentration

Ammonium is a product of metabolism of animals in water as well as decomposition of organic matter by microorganisms which the result is the conversion of nitrogen to ammonium; part of the ammonium is used directly by plants; the rest is converted to nitrite by microorganisms. The presence of NH_4^+ also indicates the level of conversion of organic pollutants in water bodies. The presence of large amounts of NH_4^+ is a potential negative factor for aquatic animals as well as microorganisms. Analysis results of the N-NH_4^+ in the subproject area in *Figure 2.20* show that the surface water at the monitoring sites is polluted with ammonium nitrogen. The concentration varies considerably, ranging from 0.08 to 2.81 mg/l. Most of the samples do not meet the environmental standard column A but the standard column B (QCVN 08-MT:2015/BTNMT). Particularly at points N2, N5, N8, N9, the value is even higher than the standard column B from 1.4 to 3.1 times. The value in high tide is higher than in low tide.

Figure 2.18: DO values of water samples taken in the subproject area

Figure 2.19: COD values of water samples taken in the subproject area

Figure 2.20: $N-NH_4^+$ values of samples taken in the subproject area

g). Nitrate concentration

Nitrate is the highest oxidation stage in the nitrogen cycle and is the last stage in biological oxidation. In rural and suburban areas, the use of fertilizers can be a source of nitrate pollution. Nitrate can fluctuate seasonally with the growth of aquatic organisms as it is an important nutrient component of aquatic life.

There have been numerous studies on the level of the poisoning of aquatic animals; Shrimp has to be exposed for a long time to the environment with high nitrate content. A series of lesions observed in shrimps exposed to high levels of nitrate are demonstrated by the elongated and non-epithelial cells, the hepatopancreas being damaged, bearded, poorly fed and abnormal metabolism.

The results of the determination of $N-NO_3^-$ content in *Figure 2.21* show that most of the samples have $N-NO_3^-$ concentration of less than 2 mg/l, belong to the A1 standard.

Figure 2.21: N- NO_3^- values of samples taken in the subproject area

h). Phosphate concentration

In nature, phosphates are considered to be the product of the process of phosphorus, often found in the form of trace in natural water. High level of phosphate is a factor in the growth of algae. This phenomenon can be originated from the pollution of domestic water, agriculture or industrial wastewater that produces detergents or fertilizers. Therefore, the phosphate indicator is used to control the level of contamination of water. Results of P-PO_4^{3-} analysis in water is similar to ammonium, the levels of phosphate at points N2, N5, N8, N9 are higher than the rest and exceed the permissible column A2 (0.2mg/L). At the remaining sites, the phosphorus concentration is relatively low or below the detection level (*Figure 2.22*).

Figure 2.22: P- PO_4^{3-} concentrations of samples taken in the subproject area

i). TSS concentration

The results of total suspended solids content (TSS) measurement varies considerably, ranging from 38.0 to 233.1 mg/l, the details are in *Figure 2.23*. There is a difference between high tide

and low tide at the sampling sites. However, due to its sediment profile, the effect is not great and they are easily removed from water through simple solutions.

Figure 2.23: TSS concentrations of samples taken in the subproject area

j). Total coliform

In natural water bodies, there are many types of living microorganisms involved in the purification of water resources, besides beneficial microorganisms that do not affect humans or animals, there are also many microorganisms that cause disease or affect human health, especially animals that are derived from warm-blooded animal feces.

The results of the total coliform determination at the sampling sites show that the highly contaminated water is from 400 to 6.800MPN/100ml. This implies the poor environmental sanitation in the area. Water always show signs of infection by warm-blooded animal feces is a potential risk arising. From the actual sampling survey, there are quite a number of households living near canals; Due to poor infrastructure and limited economic conditions, domestic waste from livestock and poultry are regularly discharged into canals that contaminating water sources.

2.2.5. Groundwater quality

Basing on the hydro-geological characteristics, the groundwater resource in Dong Thap province is divided into water aquifers in order of characteristics from top to bottom as follows:

- The first aquifer: is poor quantity, bad quality, type of sulfate-calcium-magnesia water, not meet the demand for water for domestic using. This aquifer has a total area of 1,036 km² (30% of the province's natural area), located at a depth of 35-50m, tends to sink in the direction of north-south and northwest-southeast.
- The second aquifer: irregular quality, total mineralization from 0.5-2.7g / L with average water level and irrigation capacity. This aquifer has a total area of about 1,168 km², located at a depth of 90-120m, distributed mainly in the south and southeast.
- The third aquifer: mineralization from 1.9-3.47g / L, distributed at a depth of 135-170m

with the total area of 848km², distributed mainly in three areas: Tam Nong East, Southeast Thap Muoi and Lai Vung, the bottom layer tends to sink east, southeast and southwest.

- The fourth aquifer: distributed at a depth of 190-200m, with the flow of 14-26L/s, total mineralization from 0.5-0.6 g/L, good quality, type of water Bicarbonate - Sodium, which is abundant in water, is a promising water supply in the area. The total area of this area is about 788 km², accounting for 23% of the province's area. It is widely distributed and occupies most of the large area in the north, with the bottom of the river tending to the east and southeast.
- The fifth aquifer: distributed at depths of 350m or less, good quality, high pressure. This is the water supply prospect for the whole region.

If classified by area, the groundwater of Dong Thap can be divided as follows:

- The area north of Nguyen Van Tiep canal: underground water is 100-300m. Particularly, in Tan Hong district, the groundwater is 50-100m and can be used for living.
- The area south of Nguyen Van Tiep canal and south of Tien river: abundant groundwater resources in different depths.

In general, groundwater in Dong Thap province is considered to be abundant and is being exploited for production and living in urban and rural areas. However, the underground water source of the province is in danger of being reduced in quantity and quality. Clean water sources in rural areas do not meet the demand, so people have to exploit and use underground water.

Under the subproject, the consultant has taken 5 samples of groundwater to assess the current status of groundwater quality in the subproject zone. The sampling location diagram is shown in *Figure 2.24*.

The results in the area show that the water source is not contaminated with acid sulfate (the high pH value of 7.54-7.81), which meet the standards of groundwater and water quality for domestic use. Two out of five samples have a coliform value exceeding the prescribed limit. The total hardness and chlorine content of groundwater meets the Vietnamese standard for groundwater quality (QCVN 09:2008/BTNMT). The concentration of heavy metals is quite low. This indicates that groundwater in the subproject area is quite good for exploitation.

Figure 2.24: Locations of sampling sites of groundwater

2.2.6. Mineral resources

The mineral resources are poor in Dong Thap, comprising mainly construction sand of various types which are distributed along river banks, islets, and clay for tile making as below

- Construction sand: its reserve and quality are the best as of other provinces in the Mekong Delta. Sand is distributed along with riverine islets and headlands in the Tien River and the Hau River, convenient for exploitation and transport. Riverine sand is under the form of sediment by water currents and supplemented continuously by currents of the Mekong River.
- Clay has a substantial reserve and a widespread distribution throughout the province.
- Kaolin clay is generated from river sedimentation, distributing in the northern districts of Tan Hong, Tam Nong, and Hong Ngu Town. The mine layer is about 1 – 1.5 m under the surface soil of 0.6 to 1.3 m thickness.
- Peat was formed in the 4th century, having a reserve of about 2 million m³, distributing in districts of Tam Nong, Thap Muoi under the form of bed and ancient river bottom. Peat beds under the ground surface for 0.5 – 1.2 m have a combustion heat from 4,100 – 5,700 kcal/kg.

2.3. CURRENT STATUS OF BIOLOGICAL RESOURCES

During execution and operation, it is unavoidable to have impacts on the surrounding environment as well as on the species. Therefore, the assessment of the current status of living resources in the affected area is very important, thereby providing appropriate mitigation measures, especially in the vicinity of Tram Chim NP where has high biodiversity.

In order to assess the status of the subproject's biological resources, in addition to surveying and evaluating the actual situation at the subproject site, the report also refers to a number of secondary documents and data on the investigation and assessment of biodiversity status in Dong Thap province and subproject zone.

According to the report of the current status of the environment in Dong Thap Province (2005-2009) of the Institute of Natural Resources and Environment (VNU-HCM), the biological resources of Dong Thap province are as follows:

- Aquatic species include bacteria, algae, aquatic plants, phytoplankton, zooplankton, zoobenthos floating in the water or muddy water.
 - There are 282 species of algae in 7 phyla including *Chrysophyta*, *Pyrrophyta*, *Euglenophyta*, *Chlorophyta*, *Cyanophyta*, *Bacillariophyta*, and *Xanthophyta*.
 - Algae as food for shrimp and fish with 201 species including *Bacillariophyta*, and *Euglenophyta*.
 - Zooplankton contains 105 species, including: *Rotifers*, *Copepoda*, *Coladeira*, *Protozoa*, *Molluscas*.
 - Zoobenthos contains 61 species belonging to the phyla of *Polychaeta*, *Oligochaeta*, *Insecta*, *Crustacea*
 - There have no species in the Red Book of Vietnam.
- Biodiversity at Tram Chim NP: The Park is located adjacent to the subproject area but the subproject will not impact on the Park. The flora and fauna of Tram Chim NP are diverse:
 - Flora: abundant with 130 species, typical of wetland in the Plain of Reeds, including lotus, wild rice, *Rhizoma cynodoin*, *Eleocharis*, *Ischaemum rugosum* and Melaleuca forests. Tram Chim is wetland with two dominant vegetation populations: inundated grasslands and floodplain forests.
 - Fauna: rich and typical for wetland environment, including:
 - Aquatic species have 174 species of algae, 110 species of zooplankton, 29 species of bottom animals; phytoplankton has 349 species; *Bacillariophyta* of 150 species; zooplankton have 96 species; zoobenthos of 29 species; aquatic insects of 24 species.
 - There are 55 species of fish.
 - Water birds 198 species of 25 genera, 49 families. In particular, there are animals in the famous red book of Tram Chim is Sarus crane.

2.4. SOCIO-ECONOMIC CONDITION

2.4.1. Current land use

In the subproject area, most are agricultural land. By 2015, the area is 95,178.65 ha over 114,934 ha of natural land accounting for 82.8%. At each district/town of subproject area, the area used for agricultural production occupies 68% - 83% of the total land area. In the whole area of the 4 districts/towns of the subproject area, only Tam Nong district has a forest land of 7,577 ha, accounting for a small proportion of 16.0% of district and 6.6% of the natural land area of the subproject area. The forest area in Tam Nong district includes production forest, protection forest and special-use forest but is not within the subproject area.

The annual crop land is 82,520.1 ha, accounting for 97.3%, the perennial crop land is 2,301.05 ha, accounting for 2.7%. Annual crops are mainly rice, crops and annual industrial crops.

Table 2.20 and Figure 2.25 show that the area of the subproject zone is mainly paddy field land and rice-cash crop rotation land. This is a favorable advantage to achieve the objectives of the subproject. During the implementation of the subproject, there will be no need to change the land use purpose but only based on available agricultural land, flexible rice mixed with the model of aquaculture, crops to increase livelihood during flood season.

Table 2.20: Status of land use (ha) of the subproject districts /towns in 2015

No.	District/town	Natural land	Agriculture land	Forest land	Aquaculture land	Special use land	Residential land
1	Hong Ngu town	12,184.40	9,610.32	-	537.04	1,672.79	363.83
2	Hong Ngu district	20,973.59	14,330.82	-	1,043.04	1,012.88	968.03
3	Tam Nong district	47,322	33,631	7,577	649	3726	1157
4	Thanh Binh district	34,454	27,249	-	530	2590	1591
	Total	114,933.99	84,821.14	7,577	2,759.08	9,001.67	4,079.86

Source: Statistical yearbook of subproject districts/town in 2015

Figure 2.25: Map of current land use in the subproject area

2.4.2. Social condition

2.4.2.1. Population

At present, in the subproject communes have a total natural land area of 401.96 km². The total population in the subproject area is 34,864 households, equivalent to 139,013 people, of which the number of men and women is 68,932 and 70,081 respectively (*Table 2.21*). The natural population growth rate in 2017 in the areas was 1.39%.

According to the survey data, the average number of people in a household is 4.0 people/HH which is higher than an average number of people in a household of the country with 3.89 (Statistic year book, 2017). The average age is 35.7 years old (*Figure 2.26*).



Figure 2.26: Age of household heads in the subproject area

2.4.2.2. Poor rate

The rate of poor households in the affected communes is 9.4%, with 3,722 households and ranges from 3.1% (Tan Hoi commune of Hong Ngu town) to 18.5% (Thuong Thoi Hau B commune, Hong Ngu district). In addition, the communes with high poverty rates are Thuong Thoi Hau A (15%), Thuong Phuoc 1 (13%), and An Long (13.2%), Phu Tho (11.2%) and Phu Thanh B (10.96%) in Tam Nong district. Details are in *Table 2.21*.

Poor households are concerned by the government and have specific plans for annual reduction. However, the gap between rich and poor as well as between low-income groups and high-income groups is increasing rapidly.

Table 2.21: Socio-economic information of the subproject communes

No.	District/Town	Area (km ²)	Populat ion density (people/ km ²)	Numb er of HH (HH)	Population			Rate of poor HHs in 2017 (%)	Numbe r of poor HHs in 2017 (hộ)	Average income Mil VND / people /year
					Total (people)	Man (people)	Woman (people)			
I	Hong Ngu town									
1	Binh Thanh	48.43	226	2679	10,960	5,326	5,634	9.0	265	24.8
2	Tan Hoi	11.28	673	1770	7,597	3,685	3,912	3.1	58	37.5
3	An Binh A	27.13	496	3275	13,455	6,521	6,934	3.3	109	37.0
4	An Binh B	19.1	272	1239	5,187	2,519	2,668	3.5	47	37.5
II	Hong Ngu district									
1	Thuong Thoi Hau A	13.54	557	1803	7,550	3,807	3,743	15.0	358	
2	Thuong Thoi Hau B	14.42	545	2288	7,856	3,965	3,891	18.5	500	22.0
3	Thuong Phuoc 1	34.41	586	5172	20,162	10,134	10,028	13.0	680	26.0
III	Tam Nong district									
1	An Hoa	26.3	388	2,590	10,217	5,096	5,121	7.8	211	37.0
2	An Long	18.5	731	3,392	13,525	6,746	6,779	13.2	384	37.0
3	Phu Ninh	15.3	543	2,084	8,315	4,148	4,167	9.0	204	37.0
4	Phu Tho	63.6	173	2,758	11,027	5,500	5,527	11.2	438	35.0
5	Phu Thanh A	21.6	547	2,963	11,815	5,891	5,924	7.4	223	35.0
6	Phu Thanh B	51.6	89	1,150	4,611	2,300	2,311	11.0	126	22.0
IV	Thanh Binh district									
1	Phu Loi	36.75	183	1702	6,736	3,294	3,442	6.5	119	
	Total	401.96	429.2	34,864	139,013	68,932	70,081	9.4	3,722	32.3

The interview 14 CPCs on the subproject area showed that there is a close relationship between landlessness and poverty. Most landless people are poor people, however, some people have little land are also the poor in the subproject area. Focus group discussion and in-depth interviews conducted with poor HHs (in the AHs due to land acquisition) and landless (in the beneficiary area) for the RSA in the subproject area in the 14 CPCs on December 2017, showed that the poverty and landlessness from generation to generation is a relevant feature of the vulnerabilities of a segment of the local population and these households, women have to work harder to earn for the household beside their daily housework. Incomes of local poor, depend much on the way they find for daily food, from hand to mouth: the

minimum is around 20,000 - 30,000 VND per day, the maximum is around 70,000- 80,000 VND per day, in petty trade and in paid labor for a cash crop, rice crop.

2.4.2.3. Ethnicity and vulnerable households

Dong Thap has a very small population of ethnic minorities in the subproject area (*Figure 2.27*). The ethnic Khmer, Cham, and Hoa have largely inter-married with Kinh and are largely integrated into the wider land holding Kinh communities. There are no segregated ethnic communities or villages in the area.

In total of 366 affected households due to land acquisition, there are 6 vulnerable HHs including 02 war invalids and martyrs HHs, 3 HHs having people with meritorious services to the wars and 01 near poor HH (*Table 2.22*) who are acquired land for the subproject and total area of acquired land is higher than 10% of total current area.

Source: District Socio-Economic Report, 2017

Figure 2.27: Dong Thap ethnic minority distribution

Table 2.22: Vulnerable affected households of the subproject

No	District	Near poor and poor HHs (HHs)		Mentally and physically handicapped people, or people in poor physical health; Poor women-headed HHs	Ethnic minority HHs	Social-policy HHs			Total
		Poor HHs	Near poor HHs			War invalids and martyrs (HHs)	People with meritorious services to the wars (HHs)	Vietnamese hero mother (HHs)	
1	Hong Ngu district		1						1
2	Hong Ngu town					2	2		4
3	Tam Nong district						1		1
4	Thanh Binh district								
	Total	0	1	0	0	2	3	0	6

2.4.2.4. Labor and job

In the subproject communes, the proportion of households engaged in agriculture is high in the occupational structure, accounting for 70-80% of the total number of households in each commune.

Because the subproject is not located in the forest area, there are no households working in the forestry sector. Commercial, industrial and handicraft, construction and services strongly developed Tam Nong district and Hong Ngu town.

With the main occupation of agriculture, the main source of income for households is from agriculture. Income from cultivation is mainly from rice, crops and fruit trees. Income from livestock is mainly from cattle, pigs, goats and poultry. Income from aquaculture is mainly from shrimp and *Pangasius* farming for export and other fish.

Among the affected people, the percentage of dependents is quite high, accounting for 42%, including young people aged <20 years and elders, housewives, the remaining 29% is bread-winners working in agriculture, livestock: 16% is wage earners and state wages, 6% is hired laborers, 5% make their own business and 2% working in handicraft sector (See *Figure 2.28*).

2.4.2.5. Income and living standards of households

The survey data in the subproject area showed that the per capita income of the subproject communes is 32.3 million VND/person/year, ranging from 22.0 million VND/person/year (Phu Thanh B commune, Tam Nong district and Thuong Thoi Hau B commune, Hong Ngu district) to 37.5 million VND/person/year (Tan Hoi and An Binh B communes in Hong Ngu district), see detail in *Table 2.21*.

As a likely consequence of economic growth, about 9.4% of the total survey household is living in poverty condition. Hardly, the poverty households in the subproject area can access the local infrastructures and public utility services as well as educational. The poor households in the subproject area have very limited access to the local existing infrastructures, services as well as education. An about 14.8% of total children under school age are uneducated or illiterate. The proposed subproject will create job opportunity for this group, to help them to earn additional incomes.

2.4.2.6. Education

The survey results on education level show that the level is rather low, 14.8% of people have not attended school, almost elderly; 36.1% have only completed primary school, most of them are middle-aged people from 40-60 years old and pupils of primary school age; 18.7% of people at the secondary level, these people are younger, commonly 30-40 years old and secondary school children; 16.1% of people finish high school; only 7.7% of trained workers and 5.8% of workers have college/university/postgraduate qualifications. By gender, it is noted that the percent of a female with lower education level is much higher than male. Thus, the level of education of the PAPs in the subproject area is quite low, so there should be solutions to support people in accessing and learning new livelihoods models when implementing the subproject (*Figure 2.28*).

Table 2.23: Occupations of the PAPs in the working age

No	District	Total surveyed HHs	Main occupations of the PAPs in the working age					No. of PAPs in the working age
			Agriculture	Small business	Workers/ Government officers	Seasonal workers/ Hired labors	Handicraft	
1	Hong Ngu town	480	139	24	77	29	10	279
2	Hong Ngu district	900	261	45	144	54	18	522
3	Tam Nong	56	16	3	9	3	1	32
4	Thanh Binh	28	8	0	4	2	0	14
	Total	1464	424	72	234	88	29	847

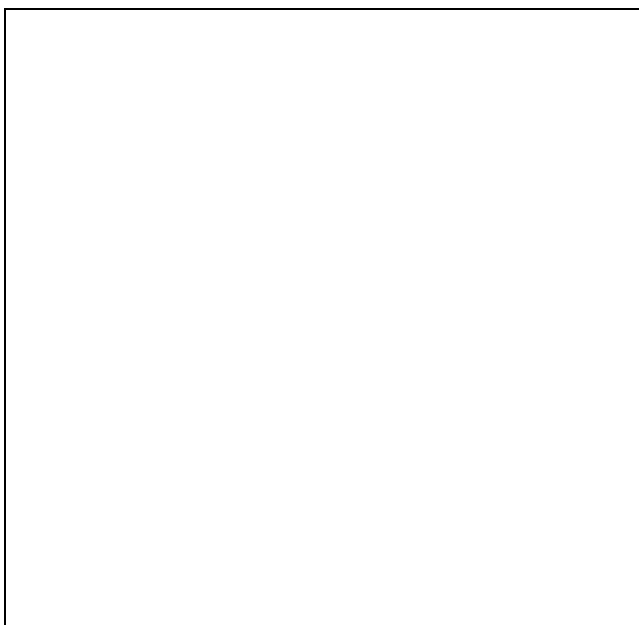


Figure 2.28: Education of affected people in the subproject area

In the 15 communes of the project, there are 14 communes with primary schools, junior high schools and pre-schools. Only An Long commune in Tam Nong district has no secondary school but the only commune has a high school. Most of the schools in the subproject communes have the good, solid or semi-permanent infrastructure. There are still some temporary schools. The number of elementary school pupils in the subproject communes is about 13,730, 6,975 pupils in secondary schools, and 833 high school pupils. The rate of drop-outs in the subproject area is low: from 0.03 to 0.2% in primary level, between 0.89 - 1.85% for secondary school and the high school is from 0.74 to 6.2%. Data on the total number of schools in the subproject districts/town are presented in *Table 2.24*.

Table 2.24: Number of school pupils in the subproject area in the school year 2015 – 2016

No.	District/town	Kindergarten	Primary school	Secondary school	High school
1	Hong Ngu district	4,915	13,120	6,996	2,163
2	Hong Ngu town	3,116	8,089	4,277	2,067
3	Tam Nong district	3,995	10,645	6,054	2,360
4	Thanh Binh district	5,206	14,398	7,844	3,018
	Total	17,232	46,252	25,171	9,608

Source: Statistical yearbook of the subproject districts/town in 2017

2.4.2.7. Gender issue

a). Labor share

The interview 14 CPCs on the subproject area showed that labor share between male and female are classified for different roles but equally respected. Men mostly work on fields and women take care of housework (cooking, cleaning, keeping money, raising children...). Women's participation in rice growing is less than in vegetable cultivation. They are involved

in light field works only like weeding in small patches, sowing and harvesting hot chili, beans.

b). Out-migration as a typical strategy to tackle with the reduction/ decline of existing livelihoods

In these focus groups, it was reported that to leave the home countryside and migrate to the big cities to find jobs in industrial processing zones or in trade and services is a 'first of all' and foremost coping strategy to tackle the decline of livelihoods relying on the weather, climate and water resources. Local people have to migrate to big cities as Ho Chi Minh City, Binh Duong, Dong Nai provinces. In many households, husbands migrate and work out, send remittances to wives and children staying at home. Without men power, the women have to carry out all hard farming works by themselves while taking care of children and housework. In addition, they are more vulnerable to the disaster, i.e. flood, while the men are absent.

c). Participation in training

As reported by participants of the focus group discussion, most participants in farmers training are male, it means that women are excluded from such capacity building activity. However, while the men migrate to work far away, women are the main labors in farming works.

Regarding livelihood models, it is a subproject objective that 40% of beneficiaries have to be women. In the livelihood programs, women should be provided equally with opportunity in the various proposed activities (i.e. join training or be part of farmers groups or other livelihood activities). Women' Union should also be involved as a facilitator during public consultation or training to facilitate the participation of women.

d). Participation in family and community activities

Labor arrangement is seen as by gender in the subproject area. Although all activities are participated by both women and men, there is a different arrangement in each field; in agricultural activities, men involve the most in earth work, transportation, and women involve the most in care and breeding work. Labor arrangement in the province is not quite different from studies, analysis of existing labor arrangement in Vietnam: Women participate in production, reproduction and care activities while men are mainly engaged in manufacturing activities. Community activities such as community meetings, training on production activities and political organization activities, participation percentage of both spouses were approximately 50%, a participation rate of men is higher than women (8% in community meetings: 17% in training on production; and 24% in political organization activities). Thus, a key role in community activities participation is occupied by men. And this reflects the restrictions on women's access to information, knowledge, including information, knowledge of production, family economic development.

There is a link between active groups in labor arrangement by gender as follows: When women have to spend too much time on caring and reproduction activities, they will have no time for production and community activities; moreover, limited knowledge and information due to lack of time to participate in community activities makes it difficult to engage in production activities. Meanwhile, only production activities generate income and area assumed as more important activities. Clearly, the involvement of women is limited than men on project activities related issues, such as consultations, information disclosure, detailed measuring survey, compensation. An inequity will make women more vulnerable

when there is no opportunity to participate.

Although the percentage of women and men altogether engaged in family decision making is over 80.0% (98% for family large spending, 98% for children's study/career, 89% for production investment), more men than women make decisions on family work, for instance, production investment is nearly definitely decided by men.

2.4.2.8. Sanitation and house condition

Housing

The situation of houses, water, electricity, telephone and environmental sanitation, common diseases and access to health services 366 affected households due to land acquisition:

- Only 2.7% of houses are permanent houses (one or more floors), 21.1% of semi-permanent houses (brick walls, iron roofs/roofs) and 76.2% are a temporary house (wooden wall or iron wall, simple house). This is a common type of house in the subproject area along the canals (*Table 2.25*).
- Environmental sanitation of affected households: Only 5.3% of PAPs (19HHs) have a septic tank, 94.7% (347HHs) directly discharges into the environment. Toilets are used of AHs include Septic tank: 241HHs (65.8%), Double-vault latrine: 48 HHs (13.1%) and 45HHs of no toilets, and they use fields as their toilets (see *Table 2.26*).

Health care

- Climate change may have some impacts on the health of the people. Common illnesses such as colds and flu have been predominantly occurring in the northern provinces due to erratic weather changes, which nowadays occur in the Mekong Delta, with 39% and 40%, respectively. In addition, there are other diseases such as respiratory diseases, dengue fever and hepatitis (see *Table 2.27*).
- In the subproject area, there are adequate health services such as commune health stations, district hospitals, clinics, pharmacies ... with a common radius of 1-5 km, people can easily choose medical treatment centers, most of which are commune health stations, followed by district hospitals to treat some common diseases.

Water supply and energy

Most people within the subproject area are reputed to rely on groundwater (drilled wells), piped water and surface water for domestic needs, 28% of respondents received water via metered water supply, the remaining 70% either shared meters (72%) or used wells, river water, rain water or purchased water from water vendors (*Table 2.28*). The water used for production is 100% from the river and canal.

As for cooking purpose, the energy sources used by the PAHs include electricity, gas, wood, and coal. In which, 86.1% of the households use gas while 6.8% use wood and 4.6% use electricity. The rest uses energy from electricity for cooking (*Table 2.29*).

Other services

- 100% of PAPs use the national grid for lighting and living.
- 100% of households use the telephone.

Table 2.25: Houses of affected households

No	District	Total surveyed HHs	Type of houses of Ahs		
			Permanent house	Semi-permanent house	Temporary house
1	Hong Ngu town	120	4	28	88
2	Hong Ngu district	225	5	41	179
3	Tam Nong	14	0	3	11
4	Thanh Binh	7	1	5	1
	Total	366	10	77	279
	Percentage	100	2.7	21.1	76.2

Table 2.26: Types of toilets of affected households

No	District	Total surveyed HHs	Type of toilet				
			Double-vault latrine	Septic tank	Temporary toilet	No WC	Overhung latrine
1	Hong Ngu town	120	16	79	14	11	0
2	Hong Ngu district	225	29	148	18	30	0
3	Tam Nong	14	2	9	0	3	0
4	Thanh Binh	7	1	5	0	1	0
	Total	366	48	241	32	45	0
	Percentage	100.0	13.1	65.8	8.7	12.3	0.0

Table 2.27: Common diseases of affected households

No	District	Total surveyed HHs	Common diseases							
			Cold	Flu	Respiratory	Dengue	Chole ra	Dysente ry	Hepat ics	Poiso ned
1	Hong Ngu town	120	48	47	16	6	0	0	4	0
2	Hong Ngu district	225	90	88	29	11	0	0	7	0
3	Tam Nong district	14	6	5	2	1	0	0	0	0
4	Thanh Binh district	7	3	3	1	0	0	0	0	0
	Total	366	147	143	48	18	0	0	11	0

Table 2.28: Domestic water sources affected households

No	District	Total surveyed HHs	Water for domestic use				
			Rainwater	River/canal water	Tap water	Dug well	Other
1	Hong Ngu town	120	0	25	95	0	0
2	Hong Ngu district	225	0	47	178	0	0
3	Tam Nong	14	0	14	0	0	0
4	Thanh Binh	7	0	7	0	0	0

	Total	366	0	93	273	0	0
	Percentage	100.0	0.0	25.4	74.6	0.0	0.0

Table 2.29: Energy for cooking of affected households

No	District	Total surveyed HHs	Energy sources for cooking			
			Wood	Coal	Gas	Electricity
1	Hong Ngu town	120	4	10	103	3
2	Hong Ngu district	225	19	6	194	6
3	Tam Nong	14	1	1	12	0
4	Thanh Binh	7	1	0	6	0
	Total	366	25	17	315	9
	Percentage	100.0	6.8	4.6	86.1	2.5

2.4.2.9. Socio-economic condition in the subproject area

This section reviews the socio-economic condition of 366AHs in the subproject area through three major components: Economic, Technical and Social. Each major component consists of sub-components shown in Table 2.30. In order to compare these components, the answers from interviewees were coded into “1” as “Low”, “2” as “Medium” and “3” as “High”. The total scores were then calculated to assess general socio-economic conditions of the studied area. It is assumed that the weight of the components is equal.

Table 2.30: Scales of Socio-economic condition assessment

Major component	Sub-component	Scales (1: low, 2: medium, 3: high)	Notes
Economic condition	1. Income affording to expenses	1 = insufficient + serious shortages, 2 = lightly sufficient, 3 = sufficient + surplus.	Based on interviewees' assumption.
	2. Living standard	1 = poor + very poor-hungry, 2 = medium, 3 = rich + fairly rich.	
	3. Credit	1 = do not have enough conditions to borrow, 2 = indebted, 3 = no need.	
	4. Monthly income per capita	1 = <2 mil VND, 2 = 2-4 mil VND, 3 = >4 mil VND.	
	5. Asset condition	1 = 0 asset, 2 = 1-2 assets, 3 = >3 assets.	It is counted on valued assets as Expensive furniture, Fridge, Hot-water tank, Computer, Microwave oven.
	6. Land capital	1= 1-35 cong, 2= 35-70 cong, 3= 70-110 cong.	Each of the sites will have a different classification.
	7. House condition	1 = Temporary house, 2 = Semi-permanent house, 3 = Permanent house.	
Technical condition	8. Production means	1 = basic means, 2 = advanced means, 3 = big means.	- Basic means: Pump machine, Motorized pesticide sprayer, Fish net, - Advanced means: Motorized rice husking machine, Milling machine, Grinding machine for animal feed, Electric

			generator, Motor boat, - Big means: Truck, Vehicle.
	9. Sufficiency of irrigation system in dry season	1 = lack seriously + insufficient, 2 = sufficient, 3 = abundant.	
	10. Age/Experience	1 = <50 years old, 2 = 50-70 years old, 3 = >70 years old.	
	11. Education	1 = non-education + primary school, 2 = junior high school, 3 = > high school.	
Social network	12. Asking for help	1= within family, 2= informal relations, 3= formal relations.	- Within family: parents, brothers and sisters, children, relatives, - Informal relations: neighbors, friends, - Formal relations: Local government, the association at working place; Local government, the association at living place.
	13. Number of association participating	1= non-participating, 2= 1-2 associations, 3= 3-4 associations.	

Economic condition: In the subproject area, the interviewed households have limited land capital (66%) and asset condition (48%). However, they are able to earn a high income (50%) as well as highly afford to their expenses (45%). Their living standard and house condition are thought to be at a medium level with the rate of 60% and 80% respectively (*Figure 2.29*).

Figure 2.29: Economic condition in the subproject area

Technical condition: Interviewees either are young or have insufficient experience. In addition, their education level is low. However, these people are willing to invest much more in advanced and big production means. Another advantage is that the irrigation system can provide enough water for agricultural and aquaculture production in the dry season (*Figure 2.30*).

Figure 2.30: Technical condition in the subproject area

Social network: *Figure 2.31* shows both asking for help and association participating are at a low level.

Figure 2.31: Social network in the subproject area

The total assessment of socio-economic condition: *Figure 2.32* shows that economic condition is better than technical condition and social network. In total assessment, the percentage of people at medium level highest occupied (82%).

Figure 2.32: Assessment socio-economic condition in the subproject area

2.4.2.10. What the farmers need to be invested by the government

Figure 2.33 shows the result of the question about farmer priority for the governmental investment to the region. This is a closed-question, the farmers had to choose three options regarding the prioritized order from high to low. Obviously, people paid more attention to the investment in infrastructure that facilitates transportation, including Roads and Bridges. Although this is a closed-question and respondent did not have any other choice, the result might have compared among the options to that the people's target is merely for the short-term vision as of to focus on economic development rather than to stabilize the social welfare such as electric, water, health, education or recreation.

Figure 2.33: Farmer priority to invest in governmental infrastructure in the subproject area

2.4.2.11. Social Structures and Cooperatives to support Livelihoods, and credit access

In Dong Thap, the Women's Union (WU) and Farmer's Union (FU) are active in the project area. While the Women's Union membership is open to all women, poor women, in particular, are attracted to the Women's Union because can access various poverty reduction, micro-credit, income generation, job creation, and women's health initiatives of the Women's Union. The WU has also been running training workshops raising awareness in climate change and environmental protection, focusing on sustainable wild/natural fish catching by avoiding destructive fishing (such as not using small-mesh fishing net or electric devices, etc.)⁷.

In contrast, the Farmer's Union attracts only land holding men who are able to make practical use of the agricultural extension training courses that are run by the FU. Poor and landless households are generally excluded from this opportunity to gain new knowledge.

The FU is also active in encouraging and facilitating the formation of self-help groups. Dong Thap, the project area included, has a reputation for having strong self-help groups, usually consisting of better off households, borne out of the solidarity that emerges when confronted with natural disasters such as floods. The subproject area has numerous self-help groups in which members gather savings in cash and use it as a financial source for each member to build a new house. Due to this cooperation, many can achieve access to a solid house confronting with flood, strong wind and heavy rain.

⁷ Focus Group Discussion, Women Group, Phu Tho commune, Tam Nong district, Dong Thap province, 14 October 2015

Other activities that self-help groups are active with include: (i) pumping and drying rice fields, hiring combine harvesters; (ii) sharing labor or sharing information on the demand for laborers; (iii) hiring laborers to harvest/catch snake-head fish, and collecting cash to jointly buy fish nets and boats, and then sharing the work to harvest fish at the fish ponds as a collaborative group⁸.

There is also a very strong presence of formal cooperatives (*Hop Tac Xa*) in the project area. Just in Tam Nong District alone, there are 38 active cooperatives, including 32 farming and 6 non-farming cooperatives. The services that these cooperatives provide include: pumping water for irrigation; discharging water to dry rice fields; buying and spreading fertilizer and pesticides; selling harvests; providing internal micro credit; seeding fields; and providing safe water supply for domestic use, etc. At present, there are a total of 7,677 members in 32 registered cooperatives. In 2014, the total revenue from 29 of the 32 cooperatives was 43,380 million VND, with net profits amounting to 7,308 million VND. Key success factors include: gaining economies of scale in production; reducing production costs; increasing net profits, etc.⁹

Apart from the credit that is available to members of the self-help groups and cooperatives, credit is available in the project area in the form of micro-credit for the poor from the Women's Union, and the Social Policy Bank, though these are often limited. General credit for agricultural investments such as buying seed and inputs is available from the Bank for Agriculture and Rural Development (Agribank), but this is restricted to land holders since they need land use right certificates to borrow from Agribank.

The strong presence of the WU and FU, self-help groups and cooperatives suggests that there are strong community structures and cultures present that will ensure a collective approach to upscale the flood-based adaptation models.

However, the household survey data in Dong Thap, 50% or more of households are indebted and have indicated that they would have difficulty in investing in new livelihoods (*Figure 2.34*).

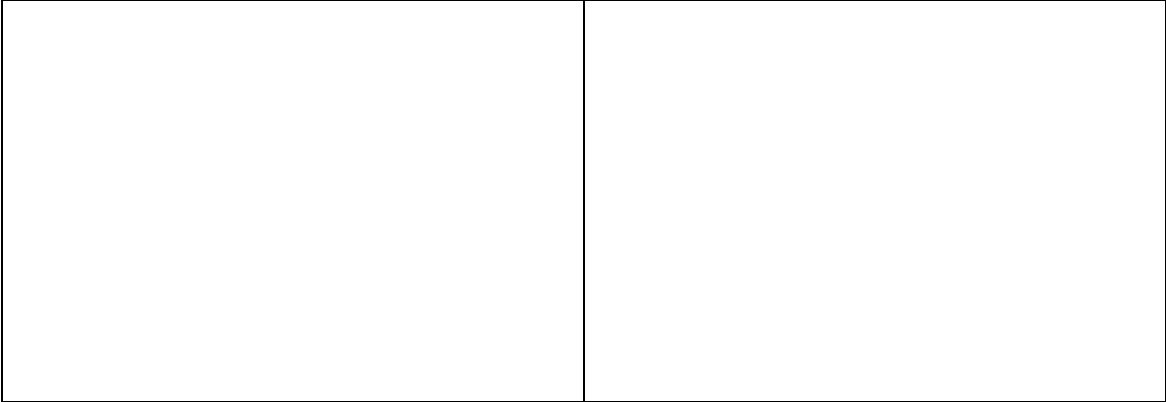


Figure 2.34: (a) Credit sources in Dong Thap; (b) Households with debt in Dong Thap

The household survey data also indicates that in Dong Thap, the highest priority support required by farmers to make the livelihood transition is investment capital followed by technical knowledge (*Figure 2.35*).

⁸ In depth interview in Phu Tho B hamlet on 13 December 2017

⁹ Special report of Tam Nong district's Steering Committee for the development of Cooperative, Collective Economy, led by the District Communist Party, dated May 2017.

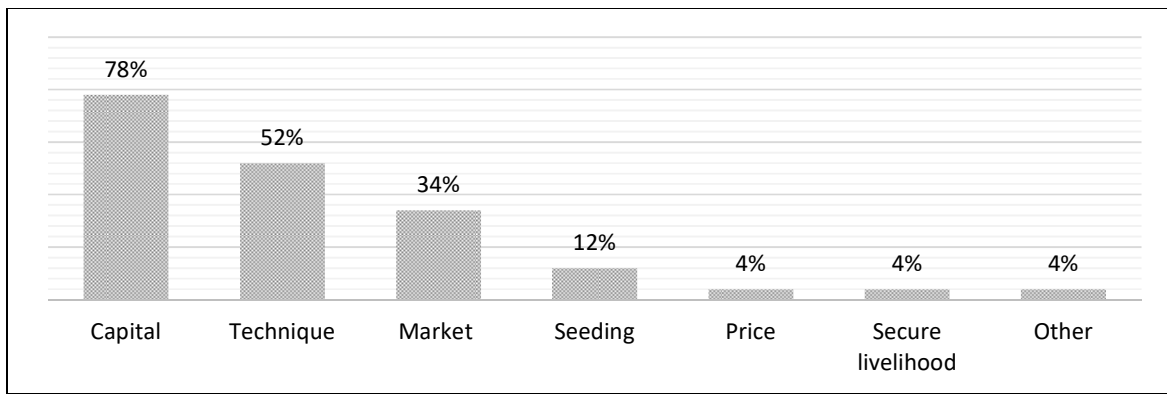


Figure 2.35: Farmer request for support to make livelihood transition in Dong Thap Province

2.4.3. Economic condition

Dong Thap province in general and the subproject area, in particular, is a long-standing agricultural production site, where natural resources and natural conditions can be classified as the most favorable for agricultural production in the MD. Alluvial soils occupy a large percentage with fresh water all year round should allow the formation of intensive agriculture of diverse crops, development of specialty fruit trees for year-round harvest combining with aquaculture which brings high profit. The economic resources of the subproject area are mainly agriculture, fisheries, processing agricultural products process and trade. The rural economy has changed, many industries and services developed in accordance with the conditions of each locality, collective economy, the farming economy is facilitated for the first stage of multi-sector direction development but the result is still limited.

In recent years, the economic structure in the subproject area tends to reduce the proportion of agriculture - forestry – fishery (region 1) from 62.85% in 2013 to 60.79 for Hong Ngu district but increase the proportion of industry and service sector (region 3) from 27.91% in 2013 to 28.43% in 2015 (See details in Table 2.31).

The development of industry focuses on the agricultural product processing industry, the rate of export of raw materials is still high, some traditional industries such as brick, tile and textile production still attract the investment but slow and small. Trade and services grow faster.

Along with economic restructuring, the composition of the economic sector has moved positively. The cooperative economy and individual development have gradually exploited the potential and wisdom of the people. Many good production models have appeared.

Over years, the subproject districts/town are getting more active in developing agricultural cooperatives, converting those under the Law on Cooperatives in 2012, step by step moving in production and create a focal point for farmers to actively link - sell products with businesses. In the districts/towns of the project area, agricultural cooperatives are increasingly being supported by districts/towns to support production development and service expansion through policy programs, development of electric pump stations, production of seeds, investment in infrastructure for crops conversion, construction of agricultural production links -consumption, etc. contribute to increasing income from irrigation services, agricultural materials, credit, etc. In Hong Ngu district, there are 13 cooperatives and 25 farmer groups; Hong Ngu town has 9 cooperatives and 18 farmer groups; Tam Nong district has 32 cooperatives and Thanh Binh district has 16 cooperatives.

However, the economic restructuring of the subproject area is slow, the economic growth is neither stable nor sustainable, the economic competitiveness is low, the socio-economic

infrastructure is poor, unsynchronized and not suitable to the advantages and the potential of the area.

Table 2.31: Economic restructuring of the subproject districts/town at current prices(%)

Year	Economic sectors	Hong Ngu district	Hong Ngu town	Tam Nong district	Thanh Binh district
2013	Region I	62.85	54.57	60.24	54.68
	Region II	9.24	19.79	10.97	21.19
	Region III	27.91	25.64	28.79	24.13
2014	Region I	62.02	52.86	59.12	52.49
	Region II	10.56	20.24	11.88	22.29
	Region III	27.42	26.9	29	25.22
2015	Region I	60.79	51.02	58	42.24
	Region II	10.78	20.8	12.85	26.75
	Region III	28.43	28.18	29.15	31.01

2.4.3.1. Agricultural, forestry and aquaculture productions

a) Agriculture

Agriculture is the main economic sector, playing an important role in the economy of the subproject area. Outstanding agricultural activities of the subproject districts are rice, aquaculture and perennial crops.

Rice: In recent years, the rice of the subproject area, in particular, has grown steadily; the intensity of crops has been maximized as much as possible. The area of rice cultivation in 2015 in the area is 168,081 ha, slightly lower than in 2014 and the yield of rice in 2015 is 1,009,728 tons lower than in 2014 (*Table 2.32*).

Table 2.32: Change of rice production over the years in the 4 subproject districts/town

Year	Winter - Spring		Summer -Autumn		Autumn - Winter		Whole year	
	Area (ha)	Yield (T)	Area (ha)	Yield (T)	Area (ha)	Yield (T)	Area (ha)	Yield (T)
2012	72,063	508,335	71,114	378,267	14,783	82,529	157,960	969,131
2013	71,724	495,765	70,441	372,051	24,266	132,388	166,430	1,000,203
2014	72,008	509,058	71,514	383,614	26,312	141,852	169,833	1,034,524
2015	69,425	479,116	61,186	385,062	27,469	145,550	168,081	1,009,728

Source: Dong Thap Statistical Yearbook, 2015

Calendar for seeding in the province, the highland seeding first, following by the low-lying area, and also depends on hydrological regime. The protected area with closed embankments may actively pump out the water to seeding earlier to avoid early floods effectively.

Corn: The area for corn planting in the subproject area in 2015 is 3,494 ha, the yield is 28,295 tons (*Table 2.33*).

In addition to rice, cash crops are the strengths of Dong Thap province in general and of the subproject area in particular. The main crops in the area are chili, watermelon, watermelon, sweet potato, sweet corn, lotus, white radish. The area of 7,958ha in the subproject area

increased by 1,476ha compared to that of 2014. Area of fruit trees in 2015 in the subproject areas is 888.6 ha, up 39.0ha compared to 2014.

Table 2.33: Area and yield of corn in the subproject area in 2015

District/town	Corn	
	Area (ha)	Yield (ton)
Hong Ngu district	1,019	8,838
Hong Ngu town	70	614
Tam Nong district	113	779
Thanh Binh district	2,294	18,064
Total	3,494	28,295

Table 2.34: Area (ha) of other crops in the subproject area over the years

Year	Annual trees			Perennial trees		
	Cash crops	Industrial trees	Others	Industrial trees	Fruit trees	Others
2012	3,233	249	3,482	114.6	868.9	29
2013	6,390	517.2	2,847	113.6	855.2	31
2014	6,482	562.4	3,110	116.1	849.7	30
2015	7,958	971.2	2,394	118.3	888.6	26

Source: Dong Thap Statistical Yearbook, 2015

Animal husbandry: see details in Table 2.35.

Table 2.35: Development of cattle and poultry over the years

Year	Buffalo	cow	Pig	Goat	Poultry
2012	1,381	5,215	37,737	1,211	1,332,813
2013	1,462	6,426	25,530	1,669	1,406,460
2014	1,494	7,849	27,179	1,984	1,345,100
2015	1,610	8,717	26,838	1,926	1,341,880

b) Aquaculture

Aquaculture is an advantage of Dong Thap province in general and in the subproject area in particular because of suitable water environment, good water quality and abundant food source but has been invested not long ago. Aquaculture is considered the second strength after rice. Dong Thap is now the leading province in terms of export Pangasius. In addition to the ponds and mudflats method, in the districts/towns of the project areas, there was effective exploitation of paddy fields in flood season.

Fishery production in 2015 in Dong Thap in general and subproject zone particular will continue to face many difficulties, especially the prices of some main aquatic products such as pangasius, fish breed decreases continuously, minor floods affect the farming of prawn. By 2015, the aquaculture area of the districts/town of the subproject is 1,936 ha, yield: 205,253 tons, of which Pangasius: 168,953 tons, down 4,322 tons compared to 2014, especially in Tam Nong district and Thanh Binh district. In the districts/towns where there is only freshwater aquaculture and aquatic species include: catfish, freshwater prawn and other

species. The fish farming area is 1,192 ha, accounting for 61.6% of the total aquaculture area, in which the area of Pangasius farming accounts for 69.5% of the total fish farming area. The area of nursery is 244ha, of which nursing surface area is 175 ha accounting for 72% (Table 2.36).

Table 2.36: Area of aquaculture (ha) in 2015

No.	District/town	Total	Shrimp	Fish	Other	Fingerlings
1	Hong Ngu district	244	0	170	0	74
2	Hong Ngu town	307	75	124	3	105
3	Tam Nong district	882	415	451	1	15
4	Thanh Binh district	503	0	447	6	50
	Total	1,936	490	1,192	10	244

Source: Statistical yearbook of the subproject districts/town

c) Current livelihood models

c1) Double rice cropping

In the double rice cropping system, the first crop (the Winter-Spring crop) is from December to end of February. After about a 4-week break, the second crop, (the Summer-Autumn crop, alternatively Spring-Summer) starts in early April and is harvested in the middle of July. In this system, land plots are also surrounded by dykes, with low ones at about 2 meters from the ground that allow floodwater to flow into the floodplain field after the harvest of the second crop. In the past, the second crop usually ended in August, so the low dykes became known as August Dykes. The land is let lie fallow and inundated for almost the entire flood season. At the end of November, when the water level recedes and the surface of the low dykes is exposed, farmers pump water out of their land plots to sow the Winter-Spring crop (Table 2.37).

Table 2.37: Seasonal calendar of double rice cropping outside dykes

	Jan	Feb	Mar	April	May	June	Jul	Aug	Sept	Oct	Nov	Dec
Rainy season						Peak						
Water rising season								Peak				
Crop 1 (Winter-Spring)												
Crop 2 (Summer-Autumn)												
Fishing or unemployment												
Flooded												

In this system, the field receives nutrient-rich sediments from the Mekong floodwater to replenish the soil. As floodwater overtops the low dykes, it flows in a sheet-flow regime, effective for flushing out toxins from the previous crops from the field. The sediments help reduce the use and cost of fertilizers and pesticides for the next crops, as the sediments act as natural fertilizers. Also in this system, rice stems tend to be stronger and less subject to diseases and pest attacks. The flooded field during the flood season is used for fishing for home consumption by the better off and for income by the poor or landless. Fishery resources

in the flood season are considered common property and everyone has free access to it. This setting has socio-economic implications in enabling the poor and landless to make a living. In this cropping system, water is pumped out from the field during the early part of the first crop (Winter-Spring crop) and pumped in after that at 2-week intervals. During the second crop (Summer-Autumn crop), water is pumped in at every 2-week intervals as well. Water shortages and hot temperatures are the main issues with this crop.

This system has several drawbacks. Each farming household has to arrange water pumping on their own, something that is relatively inconvenient compared to the triple cropping system where large electric pump stations take care of irrigation for the entire large field inside a polder. The timing of crops in this cropping system needs to be flexible depending on floodwater fluctuations, especially at the start of the Winter-Spring crop, which has to wait for the water to recede in order to pump water out of the field. The roads that are not heightened might be inundated at this time of the flood season, hindering transportation activities. The land is typically inundated annually, so households cannot develop fruit tree orchards behind their houses. When not protected by high dykes, farmers either build their houses on stilts or dig a pond and use the soil to build a high mound for the foundation of the house. Household aquaculture fish ponds require high dykes around them to protect from flooding.

c2) Triple Rice Cropping

The actual timing of the crops varies several weeks from one place to another and from year to year. To visualize this calendar, *Table 2.38* presents a typical schedule for the triple cropping system.

Table 2.38: Seasonal calendar of My Quy commune, Thap Muoi district, Dong Thap province

	Jan	Feb	Mar	April	May	June	Jul	Aug	Sept	Oct	Nov	Dec
Rainy season							Peak					
Water rising season									Peak			
Crop 1 (Winter-Spring)												
Crop 2 (Summer-Autumn)												
Crop 3 (Autumn-Winter)												

As shown in *Table 2.38*, the timing of the three crops is as follows:

- **Crop 1 (Winter-Spring).** In the second half of October, when water starts receding, farmers pump rainwater out of the polders to prepare the land and to sow seeds for the Winter-Spring crop.
- **Crop 2 (Summer-Autumn).** After the harvest of the first crop in January, there is a break time of about 2 weeks before the second crop is sown. During this crop, water has to be pumped in from the surrounding canals into the field for an average seven times, at 2-week intervals. The second crop is harvested at the end of May.
- **Crop 3 (Autumn-Winter).** After a 2 week break, in mid-June the third crop is sown to be harvested at the end of September, coinciding with the peak of the annual flood. During this crop, rainwater also has to be pumped out of the field for an average 7 times, at 2-week intervals. Towards the end of the crop, the risk of dyke breakage and leakage increases with the rise of the water level. In Thap Muoi district, after the harvest of the third crop,

water is released into the field until there is a layer of standing water about 60cm in low lying parts for about 20 days before it gets pumped out for planting the next crop. The higher grounds are, however, not flooded. In Tan Hoi commune, Hong Ngu Township, no water is released into the field.

In the triple rice-cropping system, the break times between two crops is very short, lasting for only 2 weeks. Farmers have to burn or plow over to bury the stubble from the previous crop. The short break time does not allow the buried stubble to decompose. As floodwater is kept out of the polders at all times, sediments and the attached nutrients do not enter the field to replenish the soils. According to local pump operators, little sediment can enter the fields through water pumping because, during the “sediment season” (the flood season), water is mainly pumped out from the field. Water is pumped in only during the dry season when there is little sediment in the water.

In terms of labor, a land-owning farmer today practicing triple rice cropping within polders has to do so very little physical work, as most of the necessary heavy tasks from plowing, pumping, harvesting, trashing, and transporting are done by machines. Transporting rice in the field out to the dykes can also be done by tractor or buffalo cart. For each polder, there is a pump station built and operated by a private investor from either within or outside the community. The owner of the pump station is also the main caretaker of the dyke as he has a strong stake in case the dyke breaks. Farmers today do not have to dry their rice before selling. Buyers come to the dykes and buy fresh rice from them. It must be noted that care should be taken when comparing yield today in fresh rice with past data of yield in dry rice. Weeding work, done mostly by women, is limited or even not necessary at times, as weeds are largely controlled by herbicides (which contribute to water pollution). Other petty tasks are hired out to the landless laborers in the community. However, the petty tasks provide little employment to the laborers as it takes only one to two person-days of work for a hectare of land. The work tasks that require labor are land preparation, sowing, fertilizer broadcasting, compensation planting, and chemical spraying.

In the triple rice cropping system, farmers sow seeds at the same time, advised by the commune agriculture officials, and harvest their crop at about the same time. This means that the demand for labor at the harvest seasons is very high for a short period. While the local poor laborers do not have enough employment during the year, during this time they cannot provide enough labor to meet the high demand. In Thap Muoi district, farmers explained that they hire large organized groups of laborers from other provinces, such as from Thot Not district in Can Tho, to work during the short labor-demand seasons like the sowing and harvesting times. This practice takes away employment opportunities from the landless locals in the communities and forces them to migrate out to the industrial zones. The middle-aged and elderly laborers who stay behind are left with little opportunity for petty agriculture employment tasks.

The typical setting of a polderized area is described as follows. A polder ranging from several hundred to several thousand hectares in size is usually in a rectangular shape with 4 dykes and associated canals on the sides, one or two of which are newly built or heightened from existing low dykes (August dykes), and the other one or two are heightened from existing rural roads in front of houses by a canal or river. The newly built ones are typically scarcely or not inhabited at all. Behind each house, there is usually a stretch of land 150-200 meters to the back used for fruit tree gardening, animal husbandry, pond aquaculture purposes, and family burial grounds. In Thap Muoi district, with a long history of triple cropping inside the

polders, the homestead system has adapted to the no-flood conditions. Houses, graves, animal pens, fish ponds are built low on the ground. A proposal for periodic floodwater release into the polders will be met with resistance from the majority of land holders who fear damages to their properties.

c3) Floating Rice

Floating rice used to be a main staple food crop in the Plain of Reeds and Long Xuyen Quadrangle. The area of floating rice dwindled rapidly after 1975 due to the rapid expansion and intensification of short-term, high yield rice. From 0.5 million hectares before 1975, in 2012 the extent of floating rice shrank to about 60 ha in An Giang and some small areas in Dong Thap. The diversity of floating rice variety has also reduced from five to a single remaining variety at present.

Research on floating rice farming system is being carried out by the Research Center for Rural Development (RCRD), An Giang University on 2014 showed that soil in the floating rice field is softer and less heavy than the surrounding soils as it contains more organic material. In the 2014 flood season, the researchers found 49 plant species and 35 fish species, mainly white migratory fish, many of which are of high commercial value. The results show that floating rice field is rich in biodiversity.

The main reason for the disappearance of floating rice is its low yield and the long growth duration. A floating rice crop lasts for 6 months which is twice as long as the duration of common rice fetching a yield of 2.5-3.0 tons/ha, half of that of common rice.

In the area, the economic outcome for floating rice farming can be higher than that of triple rice cropping if floating rice is combined with other crops such as using the straws from floating rice for planting *Allium chinense*. Similar conclusions on the financial advantages of combining floating rice with other cash crops were documented in a GIZ study (2014).

The challenge with floating rice is to secure a reliable market for organic floating rice-based products (rice and *Allium chinense*). As a result, the current total production of floating rice is small at about 100 tons annually, and branding has been a challenge. Dong Thap province is also interested in restoring floating rice in the province.

Presently, the private Ecofarm Company and the state-run Vinafood 2 Company have a stated commitment to buying all floating rice from farmers at the price of 12,000 VND/kg, which is about 2.5 times that of normal rice.

c4) Giant freshwater shrimp

Giant freshwater shrimp are raised in the floodplain fields that are without dykes or with low dykes during the flood season. Farmers consider shrimp aquaculture highly profitable, almost 3 times that from the flood season crop of rice, but at the same time risky. It requires a large investment to buy seed, feed and building low dykes, which poorer households cannot afford. The profit fluctuates greatly with the market price from year to year and depends on the quality of seed and price of inputs. The yield of shrimp depends on the behavior of the floodwater. High floodwater saves farmers on the cost of feed, as shrimp can derive food from the floodwater. The length of the flood season is of crucial importance to shrimp yield. If floodwaters recede early, there is not enough time for shrimp to mature (5 months is required).

A closed low dyke system is required for retaining water at the end of the flood season. For shrimp farmers, the longer the inundation period the better as rice farmers want to pump water

out to sow the next rice crop right after the floodwater recedes in order to expose the dykes. Although shrimp aquaculture is being encouraged by provincial and local authorities as an alternative to triple rice cropping, farmers still hesitate due to the risk and because of the large capital required for building the enclosing low dyke system (for retaining water) as well as buying seed and feed.

In Binh Thanh commune, Hong Ngu Township, for example, the total area under shrimp aquaculture shrank from 91 hectares in 2014 to 71 hectares in 2015. According to Dong Thap Department of Fisheries, the total area of giant freshwater shrimp aquaculture in Dong Thap in 2014 was 1,100 hectares, producing 1,700 tons of shrimp.

Aquacultured shrimp are fed with manufactured pellets and wild captured fish and snail. Farmers indicate that at present, there is no observable water pollution caused by effluent from shrimp aquaculture yet, as the area under shrimp aquaculture is small and floodwater can still flow freely during peak time. But they warned that scaling up might cause pollution in the future. At the end of the flood season when water levels are lower and the floodwater flow is weak, disease outbreaks can occur as water becomes polluted with the accumulated residues of feed and waste from shrimp farming. Shrimp aquaculture land plots downstream of other plots can be affected by the ones located upstream.

2.4.3.2. Industry and construction

In 2015, the industrial and construction sector well developed but in small scale. The main work is mechanical repair and processing, household electronic; food processing, beverages; processing agricultural and aquatic products, consumer goods; husking, polishing rice; garment, etc. and products for construction.

Industry and handicraft: There are more than 2,674 industrial and handicraft production bases currently operating in 4 districts/towns of the subproject area. The production value in 2015 is estimated at VND 7,784.5 billion and attracted about 14,755 employees.

Construction: step by step improving infrastructure, contributing to promoting socio-economic development in districts/towns. Many important projects in the fields of transportation, irrigation, markets, and administrative works have been invested for construction, repairs and put into use. Last years, Hong Ngu town has invested in the construction: Vincom center of Vingroup; supermarkets of Saigon Co.op; hospital of Thai Hoa International Hospital Joint Stock Company; Mekong resort of Sao Mai group. In Tam Nong district, there is also a program to build residential clusters and routes, the second phase: 1,789 HHs/1,939 HHs in 2015 and 1,614 HHs will be disbursed to build houses while at the eastern residential area of the provincial road (PR.) 855, measures to prevent subsidence is being carried out. Hong Ngu district in 2015 has completed the use of the project of Hoa Binh bridge, Long Huu bridge, Ba Nguyen canal bridge, inner paddy field, Ba Bay ditch, Long Khanh A1 primary school, Thanh Binh has invested in infrastructure in Binh Thanh Industrial Park with many positive results to contribute effectively to the local budget. The district is also calling for investment in Tan Thanh industrial cluster in the specialty of the area: chili, cracked rice, pangasius, corn, etc.

2.4.3.3. *Trade and services*

Trade: trade and services have made positive changes, bringing into full play the potentials and strengths of each sector and domain, especially those with high added value, thus contributing significantly to the economic growth of the districts/towns of the subproject area.

The domestic trade has been expanded, promoting the role of circulation of goods and services, contributing considerably to the development of production and stabilizing people lives. Goods gradually meet the demand for production, consumption and life. Estimated value of goods is higher than that of 2014. The main agricultural products in districts such as rice milling and pigs are quite good, producers are profitable so the purchasing power in the population increases considerably. Trade turnover increased sharply in the group of essential goods, consumption, raw materials for feeding, construction materials, interior decoration.

The management of the market, inspection and control of business activities is carried out regularly. Construction of commercial infrastructure has significantly developed, investment in markets with many sources of capital.

Import and export: Despite many difficulties, enterprises have actively sought, maintained and expanded the market for key commodities such as processed aquatic products, etc.

2.4.3.4. *Tourism*

Generous natural conditions and submerged in-land ecosystem have awarded Dong Thap province with multiple valuable ecotourism resources. The first which should be mentioned is Tram Chim NP, known both locally and internationally. This is a miniature ecological model of Plain of Reeds and the habitat of red-head cranes – a precious bird species protected by the world. Tram Chim NP also achieves 7 out of 9 criteria in the Ramsar list of wetlands of international importance. Next is Gao Giong ecotourism site. This is a 2,000ha complex of Melaleuca forest where more than 15 species of precious birds live, nest and lay eggs. Besides, the site offers a rich variety of aquatic resources, etc.

Situated by the bank of annually windy Tien River of fertility and sun, the flower village of Sa Dec is the homeland of hundreds "uncanny flowers and strange herbs". The village – one of the flower centers in the South – covers an area of around 300ha for planting flowers and ornamental trees. Here, you can see scarce and priceless bonsai of hundreds of years old. In addition to economic importance shown in high incomes brought to the regional economy, Sa Dec flowers also include cultural, art, esthetic and environmental-protecting values. Having been planned for construction, the Sa Dec flower village will soon become an interesting tourist site bearing original particularities of the Mekong Delta.

Dong Thap also has a long-term history with different cultural and historical relics. Go Thap historic site is a national cultural and historic site with a complex of 5 typical relics: Go Thap Muoi, Co Tu Towel, tomb and monument of Doc Binh Kieu, Go Minh Su and Ba Chua Xu Temple. Especially, archaeologists have discovered Oc Eo cultural relics of Phu Nam Kingdom which was around 1,500 years ago. Besides, Go Thap, in the centre of the vast Plain of Reeds, still maintains a wide ecological environment and beautiful landscapes. The Ministry of Culture – Sports and Tourism has approved the project of constructing an ecotourism site in Go Thap with recreational areas; the project of 10-storey Lotus culinary tower; Thap Muoi wildlife conservation and showroom site; historical and religious relics preservation and introduction site; and ecological site with various lotus ponds, cajuput forests

and bird grounds and fishing. The South regional committee relic is anticipated to be built and restored. Moreover, Go Thap festival (lunar March and November each year) with cultural and art activities and a folk festive atmosphere has become a remarkable event in Southern provinces that attracts hundred thousands of visitors. Meeting spiritual needs of all levels, religious and cultural tourism in Go Thap is an interesting and particular form of tourism which is potential to grow. Xeo Quyt relic – the revolutionary base during the US resistance war of wetlands – is covered with 20ha of primary cajuput forest and contains relics restoring part of the historical period of previous Kien Phong provincial committee.

The revered Nguyen Sinh Sac historical site with an extended area of nearly 11ha located in Cao Lanh city is a construction work to commemorate Nguyen Sinh Sac – the father of the greatest-ever leader of Vietnam's people - President Ho Chi Minh. Within the site, ancient Hoa An traditional village is also restored with Cai Tom canal, garden, coconut trees, plum trees, mango trees, monkey bridge, bamboo bridge, village wandering paths along the site, especially ancient houses such as “Dinh”-like (a Chinese character) house, Bat Dan house, San house, Noc Ngua house, etc.

In Dong Thap, tourists can listen to sweet and tormenting Dong Thap chantey on borderless lotus fields or rice fields, visit the ancient architecture remains of Kien An Cung Pagoda (Ong Quach pagoda), Go Quan Cung – Giong Thi Dam monument, Doc Binh Vang Palace worshipping Tran Van Nang famous general, or My An crane garden, etc.

Traditional trade villages is one of the strengths to develop tourism in Dong Thap such as: Dinh Yen mat, Rach Ba Dai building yard village, Long Thuan towel weaving village, Hong Ngu fish breeding village, etc. specialty such as Lai Vung mandarin, Chau Thanh longan, Cao Lanh mango, Phong Hoa grapefruit, Lai Vung nem (fermented pork), Hoa An plum, Sa Giang shrimp cracker, and Sa Dec noodle; and folk dishes such as grilled field mice, "dien dien" flower sour soup, braised anabas fish in clay pot, grilled snakehead fish in young lotus leaf, snakes, frogs, and pickled mud fish, etc. are also advantages for tourism that attract visitors to come and enjoy.

2.5. CLIMATE CHANGE IN DONG THAP

According to the report on the scenarios of climate change and sea level rise for Vietnam the Ministry of Natural Resources and Environment published in 2016, the content of the climate change scenarios for Dong Thap by the end of the 21st century is summarized as follows:

- Temperature in Dong Thap province from now to 2100 seems increasing 0.7-1.8⁰C (RCP4.5 scenario) and 0.9-3.3⁰C (RCP8.5 scenario). Temperature rising and abnormal changes will increase the development of pests and diseases, which affect agricultural production. At the same time, temperature rising will make aquaculture in the region less effective if water-levels are not meet the maintenance of stable habitats (see details in *Table 2.39* and *Figure 2.36*).
- Rainfall in Dong Thap province from now to 2100 also tends to increase, and the annual rainfall rises 10.0 - 17.2% (RCP4.5 scenario) and 11.0-23.7% (RCP8.5 scenario), especially in rainy seasons (see details in *Table 2.40* and *Figure 2.37*).
- Sea level rise in Dong Thap from now to 2100 tend to increase causing risk of flooding due to sea level rise and impacts of climate change on Dong Thap province is as shown in *Table 2.41* and *Figure 2.38*.

If the sea level rise concurs with the flood-water coming due to climate change, it will cause flooding and serious damage to the region, people will be very difficult to protect their summer crops and infrastructure, control floods in the region, as well as to make full use of flood-water source to develop livelihoods and raise living standards. Therefore, dredging drainage canals will better the flood drainage in flood seasons. As well as the upgrading of the low embankment, spillways, culverts and pumping stations will help to regulate and store floodwater for the development of livelihoods for local people in flood seasons.

Table 2.39: Temperature variation ($^{\circ}\text{C}$) compared to the baseline period in Dong Thap

Time	Scenario RCP4.5			Scenario RCP8.5		
	2016-2035	2046-2065	2080-2099	2016-2035	2046-2065	2080-2099
Spring	0.8 (0.4-1.2)	1.5 (0.9-2.0)	1.9 (1.2-2.8)	0.9 (0.6-1.3)	1.8 (1.3-2.8)	3.4 (2.7-4.4)
Summer	0.7 (0.3-1.2)	1.4 (0.9-2.1)	1.8 (1.2-2.6)	0.9 (0.4-1.4)	1.8 (1.3-2.7)	3.3 (2.7-4.7)
Autumn	0.7 (0.3-1.1)	1.3 (0.9-2.0)	1.8 (1.2-2.5)	0.8 (0.4-1.2)	1.8 (1.3-2.7)	3.3 (2.6-4.4)
Winter	0.8 (0.4-1.2)	1.5 (1.1-2.0)	1.8 (1.2-2.4)	0.9 (0.6-1.2)	1.9 (1.5-2.5)	3.3 (2.8-4.1)
Annual average temperature	0.7 (0.4-1.2)	1.4 (0.9-2.0)	1.8 (1.2-2.6)	0.9 (0.6-1.2)	1.8 (1.4-2.6)	3.3 (2.7-4.4)

Note: The value in parentheses is the variation around the average value of the under marginal 10% and the upper marginal of 90%

Figure 2.36: The scenarios of annual average temperature change ($^{\circ}\text{C}$) in the South region

Table 2.40: The changes in rainfall (%) compared to the baseline period in Dong Thap

Time	Scenario RCP4.5			Scenario RCP8.5		
	2016-2035	2046-2065	2080-2099	2016-2035	2046-2065	2080-2099
Spring	11.2 (4.2-18.8)	28.5 (12.1-44.7)	20.2 (7.0-32.9)	14.1 (2.1-26.1)	19.3 (9.4-29.3)	35.5 (24.5-45.2)
Summer	4.3 (0.7-8.1)	5.2 (-2.9-13.5)	7.7 (1.8-13.1)	8.6 (4.1-13.2)	11.8 (7.3-15.9)	12.6 (5.4-19.9)
Autumn	9.2 (-1.2-19.2)	7.5 (-7.5-22.5)	6.1 (-3.8-15.8)	1.6 (-7.0-10.2)	9.7 (0.6-18.3)	11.8 (-1.9-25.8)
Winter	48.6 (3.3-88.4)	50.7 (22.2-79.2)	90.0 (17.1-151.0)	30.5 (5.4-55.3)	35.3 (5.0-66.2)	53.8 (9.6-99.2)
Annual average rainfall	10.0 (4.8-15.1)	17.9 (8.9-28.0)	17.2 (5.3-28.4)	11.0 (4.4-17.4)	16.2 (10.7-22.2)	23.7 (15.6-32.0)

Note: The value in parentheses is the variation around the average of the under marginal 20% and the upper marginal 80%

Figure 2.37: The scenarios of the annual rainfall change (%) in the South region

Table 2.41: Risk of flooding in Dong Thap province

District/city	Natural area (ha)	The risk of flooding (% of area) corresponds to sea level rise					
		50cm	60cm	70cm	80cm	90cm	100cm
Cao Lanh	49,126	0.42	0.77	1.30	1.80	2.53	7.39
Chau Thanh	24,585	1.73	3.07	3.61	4.27	5.11	7.30
Hong Ngu	21,711	0.18	0.50	0.60	0.90	1.06	1.25

Lap Vo	24,546	KDK	0.01	0.05	0.23	0.66	2.65
Lai Vung	23,914	0.89	0.98	1.12	1.58	4.25	11.72
Tam Nong	47,412	0.04	0.12	0.25	0.39	0.65	1.17
Thanh Binh	34,230	0.02	0.04	0.11	0.21	0.39	0.51
Thap Muoi	53,368	0.46	1.19	1.68	2.13	2.94	9.36
Tan Hong	31,113	0.03	0.06	0.09	0.14	0.30	0.59
Cao Lanh city	10,830	0.17	0.32	0.52	0.67	0.71	0.95
Hong Ngu town	11,462	0.29	0.67	1.32	2.11	2.68	2.97
Sa Dec city	5,919	0.01	0.06	0.14	0.28	0.83	4.32
Province	337,860	0.36	0.69	0.96	1.28	1.94	4.64

Note: The subproject districts/town are highlighted

Figure 2.38: Flood map corresponding to sea level rise of 100 cm in Dong Thap province

2.6. CHARACTERISTICS OF BACKGROUND CONDITIONS OF THE SUBPROJECT

2.6.1. Natural receptors

Some natural objects around the subproject zone include Tram Chim NP, Gao Giong Ecological Tourism Area, Lang Sen Wetland Reserve, Bung Binh Thien Ecosystem, Sam Mountain, Tra Su Melaleuca forest, Dai mountain, Cam mountain, Tuc Dup mountain. Most of these natural receptors are located 10 to 60 km from the subproject zone, except Tram Chim NP adjacent to the subproject. See *Figure 1.24* and *Table 1.9* for details.

Figure 2.39: Sensitive and important natural receptors in the subproject area

Table 2.42: Distance from natural receptors to the subproject location

No.	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
1	Tram Chim National Park	0.07	Culvert + West bank Pump Station of Phu Thanh 3 Canal (Thong Nhat) (Compartment No.13)- (combined irrigation culvert)
2	Gao Giong Ecological Tourism Area	10	Hardening semi-dyke of northern bank of An Phong – My Hoa (from canal 2/9 to Thong Nhat canal)

3	Lang Sen Wetland Reserve	25.6	Culvert + West bank Pump Station of Phu Thanh 3 Canal (Thong Nhat) (compartment No.13)-(combined irrigation culvert)
4	Bung Binh Thien Ecosystem	15.5	Strengthening semi-dyke of eastern bank of Suon 2 canal
5	Sam Mountain	27.5	Strengthening semi-dyke of eastern bank of Suon 2 canal
6	Tra Su Melaleuca forest	37.4	Strengthening semi-dyke of eastern bank of Suon 2 canal
7	Dai Mountain	55.2	Strengthening semi-dyke of eastern bank of Suon 2 canal
8	Cam Mountain	47.8	Strengthening semi-dyke of eastern bank of Suon 2 canal
9	Tuc Dup Mountain	60.2	Strengthening semi-dyke of eastern bank of Suon 2 canal

2.6.2. Socio-economic receptors

Socio-economic receptors in the subproject area can be counted as primary, secondary, high school, market, people's committees, clinics, border guard stations. These located near the construction site in the subproject with a common distance of 50 - 600m, so it should be noted during the construction process. See *Table 1.10* and *Figure 1.25* to *Figure 1.28* for details.

Table 2.43: Distance from Socio-economic receptors to the subproject location

No .	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
I	Hong Ngu District		
1	Border Station	0.8	Muong Vop Pump Station
2	Thuong Thoi Hau A CPC	0.98	Muong Vop Pump Station
3	Thuong Thoi Hau B Secondary School	0.79	Xeo Chon Pump Station
4	Thuong Thoi Hau B CPC	0.6	Cay Dua Sluice
5	Cau Mong Market	0.27	Cay Dua Sluice
II	Hong Ngu Commune		
1	Binh Thanh Primary School	0.25	Strengthening spillway of Binh Thanh 2 Canal, bordered with Tan Thanh – Lo Gach (2 banks)
2	Binh Thanh High School	2.3	Strengthening semi-dyke: the north bank of Khang Chien 1 canal
3	Binh Thanh CPC	2.0	Strengthening semi-dyke: the north bank of Khang Chien 1 canal
4	An Binh B Primary School	0.20	Strengthening spillway: Khang Chien canal bordered with Hong Ngu-Vinh Hung Canal (the east bank)

No .	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
5	People's Committee of An Binh B Commune	0.60	Strengthening spillway: Khang Chien canal bordered with Hong Ngu-Vinh Hung Canal (the east bank)
III	Tam Nong District		
1	Phu Thanh B Primary School	0.17	Strengthening semi-dyke: the east bank of Khang Chien canal (bordered canal of Hong Ngu town-Tam Nong and Thanh Binh-Tam Nong)
2	Phu Thanh A Wharf	0.05	Strengthening semi-dyke: the north bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
3	Phu Thanh A High School	0.19	Strengthening semi-dyke: the north bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
4	People's Committee of Phu Thanh A	0.15	Strengthening semi-dyke: the north bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
5	People's Committee of Phu Tho commune	0.2	Strengthening semi-dyke: the north bank of Dong Tien canal (from canal 2/9 to Thong Nhat canal)
IV	Thanh Binh District		
1	Phu Loi Primary School	0.05	Strengthening semi-dyke: the east bank of Khang Chien canal (from Duong Gao Canal to bordered canal of Tam Nong)
2	Phu Loi Secondary School	0.05	Dredging the Khang Chien Canal (from Tam Nong-Thanh Binh Canal to An Phong-My Hoa Canal)
3	Health Station of Phu Loi Commune	0.05	Dredging the Khang Chien Canal (from Tam Nong-Thanh Binh Canal to An Phong-My Hoa Canal)

Figure 2.40: Socio-economic receptors in Thanh Binh district

Figure 2.41: Socio-economic receptors in Tam Nong district

Figure 2.42: Socio-economic receptors in Hong Ngu town

Figure 2.43: Socio-economic receptors in Hong Ngu district

2.6.3. Characteristics of background conditions at the construction sites

Characteristics of background conditions at the construction sites of the subproject are described in *Table 2.44* to *Table 2.47*.

Table 2.44: Site-specific conditions along the dredging item

No.	Work Item/Location and photos/map	Noticeable Features
1	Khang Chien canal section from Tan Thanh – Lo Gach to An Phong – My Hoa	
1.1	Km 0 – Km 4+100	The two sides of this section are fields, no inhabitants

No.	Work Item/Location and photos/map	Noticeable Features
1.2	From km 4+800 to Km 8+600	<p>This section starts from the section adjacent to the canal - Vinh Hung - Hong Ngu stretching to Kho Be residential line (RL).</p> <p>People are scattered on the canal banks, concentrating mainly at the head of Vinh Hung - Hong Ngu canal with the length of about 1.5km and Kho Be RL with the length of about 700m.</p>
1.3	From Km 9+400 to Km K12+400	<p>This section starts from Hong Ngu - Tam Nong border canal to An Binh canal.</p> <p>There have about 20 households living scattered along the two sides of Khang Chien canal.</p>
1.4	From Km 12+400 to Km 20+600	<p>This section starts from Ca No residential cluster of Phu Thanh B commune, Tam Nong district, to the residential cluster (RC) of Phu Thanh A commune.</p> <p>People are scattered along two sides of the Khang Chien canal and in Ca No residential cluster (with the length of 250m) and in Phu Thanh A residential cluster of (with the length of 1,000m).</p> <p>There have sensitive receptors as Phu Thanh B primary and secondary schools</p>

No.	Work Item/Location and photos/map	Noticeable Features
		and Phu Thanh A high school, Phu Thanh A CPC and a small ferry.
1.5	Km 25+00 to Km 30+300	<p>This section starts from Tam Nong- Thanh Binh Canal to An Phong-My Hoa Canal.</p> <p>In this section, people live scattered on both sides, mainly concentrated in the Khang Chien RL with about 1 km long and in the RL has the Health Station of Phu Loi Commune and Phu Loi Secondary School (both are 50m far from the section)</p>

No.	Work Item/Location and photos/map	Noticeable Features
2	Khang Chien 1 canal	<p>This section starts from So Ha River to Khang Chien canal.</p> <p>In its 2 sides are mostly fields, people only live in the sub-section of 500m near the NH30</p>
3	Border canal from Hong Ngu town to Tam Nong	There are mainly fields and no inhabitants on the 2 side of the canal.
4	Border canal from Thanh Binh to Tam	There are mainly fields and no inhabitants

No.	Work Item/Location and photos/map	Noticeable Features
	Nong	on the 2 side of the canal.
5	Ca Cai Canal from Khang Chien canal to Hai Thang Chin canal	There are mainly fields and no inhabitants on the 2 side of the canal.

Table 2.45: Site-specific conditions in the sluices and pumping stations

No.	Work Item/Location and photos/map	Noticeable Features
1	Muong Vop pump station	The station is located at the head of Muong Vop creek, near the Thuong Thoi Hau A commune RL, Hong Ngu district Both sides are crowded, inside is paddy fields.
2	Chin Hue pump station	The station is located in Chin Hue creek, near the RL of Thuong Thoi Hau B, Hong Ngu district Both sides of the station are crowded people and in the field side is paddy fields.

3	Dau Ca Cat sluice + pump station	The sluice is located on Ca Cat canal, near the RL of Thuong Thoi Hau B, Hong Ngu district, in the field side is paddy fields.
4	Nam Mung sluice	The sluice is located on Nam Mung canal, near the RL of Thuong Thoi Hau B, Hong Ngu district, in the field side is paddy fields.
5	Cay Dua culvert	<p>The sluice is located on Cay Dua creek, next to Cau Muong creek, belongs to Thuong Thoi Hau B commune, Hong Ngu district</p> <p>There are a few households living near the culvert and in the field side are paddy fields.</p> <p>Cau Mong market is 270m far from the culvert</p>

6	Kho Be sluice (K3-An Binh A)- (sluice for irrigation)	The sluice is next to Kho Be RL, Hong Ngu town, in the field side is paddy fields.
7	Bay Muoi Hai culvert + pump station (K2-An Binh B)	The sluice is located on the west bank of Thong Nhat canal, on the RL of An Binh B commune, Hong Ngu district. Near the culvert is some households, in the field side is rice fields and 50 meters far from the sluice is Pangasius ponds

8	Ong Nhon culvert + pump station (K2-An Binh B)	The sluice is located on the west bank of Thong Nhat canal, a side of the sluice next to the RL, in the field side is rice fields and a pangasius pond
9	Sluice+ Pump Station of Khang Chien canal West bank (Cu Lao Chim)- (irrigation sluice)	The sluice is located on the west bank of Thong Nhat canal, Tam Nong district. Surrounding areas are giant freshwater shrimp ponds

10	Culvert + pump station of West bank of Phu Thanh 3 canal (Thong Nhat)	<p>The culvert is located on the west bank of Thong Nhat canal, Tam Nong district. There have 10 households living scattered in a radius of 200m</p> <p>The other side of the culvert is Tram Chim NP</p>

	Ho Dau pump station (East corner of Duong Gao-Khang Chien canals)	The station is located on the south bank of Duong Gao canal, Thanh Binh district. It is surrounded by rice fields, 50m from the other side of the canal is the Phu Loi secondary school

Table 2.46: Site-specific conditions along the embankment and spillway strengthening

No.	Work Item/Location and photos/map	Noticeable Features
1	Spillways	
1.1	Ca Sach canal head, adjacent to So Thuong River (2 banks)	The strengthening section next to the RA of Thuong Thoi Hau A commune, Hong Ngu district

No.	Work Item/Location and photos/map	Noticeable Features
1.2	Coi Tieu canal head of adjacent to So Thuong River (2 banks)	The strengthening section next to the RL of Thuong Thoi Hau A commune, Hong Ngu district
1.3	Coi Dai canal head adjacent to So Thuong River (2 banks)	The strengthening section next to the RL of Thuong Thoi Hau A commune, Hong Ngu district

No.	Work Item/Location and photos/map	Noticeable Features
1.4	Head of Ca Cat sluice and pump station (2 banks)	The strengthening section next to the RL of Thuong Thoi Hau B commune, Hong Ngu district
1.5	Nam Mung sluice head (2 banks)	The strengthening section is behind Nam Mung sluice, in the RL of Thuong Thoi

No.	Work Item/Location and photos/map	Noticeable Features
		Hau B commune, Hong Ngu district
1.6	Hai Thang Chin canal border Hong Ngu – Vinh Hung Canal (East bank)	The strengthening section is located in the RA at the head of Hai Thang Chin canal, adjacent to Hong Ngu - Vinh Hung canal

No.	Work Item/Location and photos/map	Noticeable Features
1.7	Khang Chien Canal next to Hong Ngu – Vinh Hung Canal (East bank)	The strengthening section is located in the RA at the head of Thong Nhat canal, adjacent to Hong Ngu - Vinh Hung canal
2	Embankment	
2.1	West bank route of Khang Chien Canal (from Hong Ngu-Vinh Hung Canal to Hong Ngu - Tam Nong Canal)	People live scattered along the canal and concentrated only in the area near Hong Ngu-Vinh Hung canal and Kho Be RC belonging to 2 communes of An Binh A and An Binh B of Hong Ngu district.

No.	Work Item/Location and photos/map	Noticeable Features
2.2	East bank route of Khang Chien Canal (from Hong Ngu-Tam Nong border canal to Thanh Binh-Tam Nong border canal)	People live scattered along the canal and concentrated only in Ca No RC (Phu Thanh B) and the RC of Phu Thanh B, Tam Nong district
2.3	East bank route of Khang Chien Canal (section from Duong Gao Canal to Tam Nong border canal)	People live in Khang Chien RL with a length of about 400m, Phu Loi Commune, Thanh Binh District Phu Loi 2 primary school is 50m far from the route

No.	Work Item/Location and photos/map	Noticeable Features
2.4	North bank of Dong Tien canal (from Hai Thang Chin canal to Thong Nhat canal)	50m far from the strengthening section is Phu Thanh A Wharf

Table 2.47: Site-specific conditions around disposal sites

No.	Work Item/Location and photos/map	Noticeable Features
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1	Site No.1	The side is surrounded by fields
2	Site No. 2	The side is surrounded by fields

3	Site No. 3a, 3b, 3c	<p>These sites are located 2 communes of An Binh A and An Binh B, Hong Ngu town and behind Kho Be RL</p> <p>The sites make use of the earth ponds which used to exploit soil for leveling Kho Be RL.</p>
4	Site No. 4	<p>The site is located in Phu Thanh B, Tam Nong district and from the site through An Binh canal is Ca No RC</p> <p>The site makes use of the earth pond of exploiting soil for leveling Ca No RC</p>

5	Site No. 5	<p>The site is located behind Khang Chien RL in Phu Loi commune, Thanh Binh district</p> <p>This site makes use of the earth pond which used to exploit soil for leveling Khang Chien RL.</p>
6	Disposal sites along canal banks	
6.1	Khang Chien canal section from K0-K4+100	The side is surrounded by fields
6.2	Hong Ngu-Tam Nong border canal	The side is surrounded by fields

6.3	Border canal of Tam Nong – Thanh Binh	The side is surrounded by fields
6.4	Ca Cai canal	The side is surrounded by fields

CHAPTER 3. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Chapter 3 evaluates and forecasts environmental impacts, including positive, negative, accumulating impacts on the physical environment (soil, water, air), biological environment, and the socio-economic status of the subproject area relating to the selected plans for each subproject work and based on the current status of the natural and socio-economic environment of the area.

The subproject will cause certain impacts on the natural environment and the socio-economic condition. The task of the environmental impact assessment is to create an initial environmental baseline and to evaluate subproject impacts on environmental resources which should be detailed for each subproject activity. The forms and levels of environmental impact assessment of the subproject are considered in different perspectives and aspects: direct - indirect, longterm - short term, cumulative, non-cumulative, severe, medium, light, negligible, adverse or harmful, minimizable, unminimizable, unknown impacts.

It is noted that although the potential negative impacts of structure works (canal dredging, semi-embankment and spillway lining/strengthening and rehabilitation or construction of sluices and pumping stations) to be invested under this subproject is in line with the key findings of the REA or ESMF for the MD-ICRSL project that it will generally increase the level of air, noise, vibration, and water pollution as well as increasing local traffic congestion including road safety risks and disturbance to local residents and they could be mitigated by (a) ensuring that contractors apply good construction practices and initiate/maintain close consultation with local authorities and communities throughout the construction period; and (b) close supervision of field engineers and/or environmental officer as recommended in the REA. However, to comply with the Government's expectation for the EIA analysis, the ESIA also included the results of the analysis related to air/noise and water pollution in Section 3.4.1. As suggested by the REA, these impacts will be mitigated through the application of the Environmental Code of Practices (ECOP) and which has been prepared in line with the ESMF.

Potential negative impacts of the subproject activities during operation of the livelihood models have also been found to be small to moderate, and they can be mitigated through technical assistance to be provided during the preparation and implementation of the livelihood development models (in non-structure work of this subproject). The technical assistance will also address the need for extensive consultation with water users and key stakeholders during the development and possible impacts due to expansion of the livelihood model without adequate management and control.

3.1. POSITIVE IMPACTS OF THE SUBPROJECT

Two components have been proposed in this subproject, including structural works and non-structural works. The proposed structural works include canal dredging, embankment and spillway lining/strengthening and rehabilitation or construction of sluices and pumping stations. Non-structural works are related to agricultural production demonstration models. Implementation of the subproject will bring positive impacts for the subproject areas as follows:

Positive impacts on drainage and flooding: The dikes in the region are identified as the August dikes with the purpose of preventing early floods to protect production in combination with the open culverts, underground culverts, pump stations and spillways at the head of main canals people can take initiative to collect and drain water at late flood seasons to promote production. During main floods, the dikes will be flooded and flood water is drained via spillways into fields and culverts to increase flood drainage and develop the livelihoods in the direction of flood exploitation. As a result, the Subproject basically neither prevent main floods nor change the flood situation compared with the current status of soil dikes. The only difference is that thank to the strengthened dikes (reinforcing of dikes, construction of culverts, sluices, and spillways), people will actively bring flood water into their fields at beginning flood seasons, store and take initiative in draining flood water at ending flood seasons to reduce damages compared to the current soil dikes.

Positive social impacts: the subproject implementation will include development plans to help the population in the subproject area, including: (i) contribute to local employment during the flood seasons: previously, when floods come, local people leave their fields to other provinces to find jobs. When implementing the subproject, people can continue to make a living with suitable models of their own or work for other aquaculture households, which contribute to stabilizing the local economy; (ii) improve the road network of the subproject communes and districts: the current state of the semi-dikes is mostly soil or macadam roads. The road surface is only 0.4 to 0.8m wide. Pedestrians and motorcycles on roads are not convenient, especially when it rains. When floods start the roads are completely useless. The subproject will carry out dike reinforcement; therefore, they will be roads for residents in dry seasons, early flood seasons and late flood seasons. Thus, the subproject implementation will improve road traffic condition compared to the current status. The roads also serve people to transport raw materials for rice production in dry seasons and agricultural products when harvesting.

Contributing to economic development: Thank the system of August flood control as semi-dikes, open culverts, underground culverts, spillways, the flood time will be slower and more stable. People are peaceful to have enough time to grow another cash crop or rice crop, etc. after the W/S crop. In addition, the diversification of crops such as the models of vegetables, aquatic plants and lotus plants will diversify agricultural products, increase the value of rice production.

Improving environmental pollution and risks: Thank the rotation with other crops or other aquaculture models instead of specialized rice cultivation as before, it contributes to the reduction of pest and disease outbreaks in the next crops as well as reduces the use of plant protection chemicals in the next crops. In addition, the production of rice under IPM and aquaculture under VIETGAP standards will increase the soil nutrition, reduce pests, reduce the amount of fertilizer for rice in the next crop and increase profits for farmers.

3.2. POTENTIAL NEGATIVE IMPACTS AND RISKS OF STRUCTURAL WORKS

As mentioned above, the ESIA consultant conducted supplement thorough site visit to identify site-specific features and prepare descriptions notes for the construction area of canal dredging; semi-embankment and spillway lining/strengthening, and rehabilitation or construction of sluices and pumping stations (including the medium voltage power lines).

Potential negative environmental and social impacts and risks below are mainly applicable to the structural works. The scale of potential impacts is classified as below:

- None (N) - No impact;
- Low (L) - Low impact: minor impacts, localized and reversible, temporary
- Medium (M) - Medium impacts: moderate impacts, localized, negligible with the application of mitigation measures;
- High (H) - High risk of impacts on environment and society, manageable and reducible with the application of mitigation measures.

The potential socio-environmental impacts and risks associated with structural and non-structural works in this subproject are screened and assessed in *Table 3.1*.

Table 3.1: Level of negative impacts and risks

Components	Physical			Biological		Social				Others	
	Air, noise, vibration	Soil, water	Solid waste, dredged sludge	Forest, natural ecosystem	Fish, aquatic life	Land acquisition, resettlement	Indigenous peoples	Physical cultural resources	Livelihood, community disturbance	Local flood, traffic, safety	Off-site impacts
Canal Dredging											
Preparation	L	L	L	N	N	M	N	N	L	L	L
Construction	L	M	M	L	L	M	N	L	L	M	M
Operation	L	L	L	L	L	N	N	N	L	N	N
Remarks	Small and medium scale works with small impacts. Most impacts of small and medium scale works are localized and temporary and can be mitigated through the application of technical solutions and good construction management practice with strict supervision, inspection and consultation with the local community										
Sluice gate and pumping station rehabilitation/construction											
Preparation	L	L	L	N	N	M	N	N	L	L	M
Construction	M	M	M	L	L	L	N	L	L	M	M
Operation	L	L	L	L	L	N	N	N	L	M	N
Remarks	Small and medium scale works with small impacts. Most impacts of small and medium scale works are localized and temporary and can be mitigated through the application of technical solutions and good construction management practice with strict supervision, inspection and consultation with the local community										
Embankment and spillway lining/strengthening											
Preparation	L	L	L	N	N	L	N	N	L	L	M
Construction	M	M	M	L	L	L	N	L	L	M	M
Operation	L	L	L	L	L	N	N	N	L	M	N
Remarks	Small and medium scale works with small impacts. Most impacts of small and medium scale works are localized and temporary and can be mitigated through the application of technical solutions and good construction management practice with strict supervision, inspection and consultation with the local community										
Piloting livelihood models											
Preparation	N	N	N	N	N	N	N	N	N	N	N
Construction	N	N	L	N	L	N	N	N	N	N	N
Operation	N	M	M	M	N	N	N	N	M	L	L
Remarks	With the small area of demonstration of livelihood models, raising aquaculture on biosecurity will cause low impacts on environment. Environmental perspective scaling up of these models would bring more benefit than harm. However, there would be risks of model failure forcing farmer revert										

Components	Physical			Biological		Social				Others	
	<i>Air, noise, vibration</i>	<i>Soil, water</i>	<i>Solid waste, dredged sludge</i>	<i>Forest, natural ecosystem</i>	<i>Fish, aquatic life</i>	<i>Land acquisition, resettlement</i>	<i>Indigenous peoples</i>	<i>Physical cultural resources</i>	<i>Livelihood, community disturbance</i>	<i>Local flood, traffic, safety</i>	<i>Off-site impacts</i>
	<i>back to the intensive shrimp aquaculture. Therefore, the risk could be assessed as moderate</i>										

3.2.1. Negative impacts during the pre-construction phase

Land acquisition and site clearance are the main activities to be undertaken in the preparation phase that have potential social and environmental impacts and risks. Issues related to site clearance including dust, noise, solid waste generation, interruption of existing services such as power supply, and safety risks related to the demolition of structures. In addition, safety during site clearance may also be at risk due to some unexploded objects may still be left underground from the war. These potential impacts and risks are discussed in detail below.

3.2.2. Land acquisition of the subproject

Impacts of land acquisition: Only the structural components acquire land and livelihood models does not. During subproject preparation, Subproject Owner and the FS Consultant have tried to minimize land acquisition through site selection.

However, the land acquisition would be unavoidable. In total, the subproject will acquire 9.48 ha of crop land and 0.6ha of residential land in 15 communes of 4 districts and towns in Dong Thap province. In addition, the subproject also uses some land on canal sides, ditches sides and public land for disposal sites. *Table 3.2* and *Table 3.3* summarizes the impacts of land acquisition and site clearance.

Table 3.2: Summary of land acquisition of the subproject

No.	Items	Area of land acquired (m ²)		Structures on acquired land (m ²)			Tree (trees)		
		2 rice-crop land	Residential land	Solid house	Semi-solid house	Temp. house	Fruit tree	Timber	Bamboo
1	Dredging canals	45,000							
2	Strengthening semi-dyke	13,430	123		10	103	330	4,985	
3	Strengthening overflow passage	18,051	3,516		8	6	10	250	7
4	Culverts, sluices	9,900	2,350	1	5	8	25	156	3
5	Pump stations	8,400							
	Total	94,781	5,989	1	23	117	365	5,391	10

Table 3.3: Summary impacts due to land acquisition of the subproject

Total	Ethnic minorities	Permanent impacts					Temporary impacts	
No. of AH	No. of AH	No. of AH	No. of physically displaced HH	Production land acquisition (m ²)	Residential land acquisition (m ²)	No. of affected graves	No. of AH	Land acquisition (m ²)
366	0	366	141	9.48	0.60	0	0	0

Land acquisition will affect 366 households (HHs) or 1,464 people. 141 houses of these affected HH will be relocated in which one is a permanent house, 117 temporary houses and 23 semi-permanent houses (*Figure 3.1*). Among these, 113 temporary and semi-temporary

houses are relocated for strengthening 77.47km semi-dyke. In addition, 5,756 trees including 5,391 timber trees (Eucalyptus, Lauclea, Samanea saman) and 365 fruit trees (mango, jackfruit, etc.) will be cut down. In 366 affected households, 341 households lost their production land. Of this, 43 households lose 20% of their land (account for 11.7%).

Figure 3.1: Typical houses and vegetation along canals in the subproject area

Social impacts on displaced households: According to subproject FS, only 141 houses will be affected, mainly are temporary houses for production, these households still have houses in the concentrated residential clusters and areas near the affected houses, no households have to relocate.

Impacts on households losing production land (agricultural land): The households losing production land would be affected in terms of income and livelihoods. With a local population depending much on agricultural activities for a living and on highly seasonal job opportunities, low qualifications and the lack of skills will further limit their ability to find non-agricultural jobs so as to generate incomes. The people who may suffer from the adverse impacts or be exposed to the risk of further impoverishment due to the loss of production land include: (i) female household heads (single, widowed or with husbands incapable of working) having dependents, (ii) people with disabilities and helpless elderly people, (iii) poor people in accordance with the criteria of the Ministry of Labor, Invalids and Social Affairs, and (iv) people without land. The subproject will provide assistance in livelihood restoration and training for income losers, especially vulnerable households.

The above assessment shows that the impact level of land acquisition in the Subproject is moderate. In order to address the potential impacts related to land acquisition, adequate compensation, support and assistance should be provided to the affected households. A RAP (Resettlement Action Plan) has been developed to set out compensation and support protocols

for the affected households to address the potential impacts of land acquisition. The key contents of RAP are summarized in Chapter 5.

3.2.2.1. Environmental Impacts and Risks of Site Clearance

Issues related to site clearance including dust, noise, solid waste generation, interruption of existing services such as power supply, and safety risks related to a power line or demolition of structures. These potential impacts and risks are discussed in detail below.

Dust and Noise. Tree cutting and house demolition will generate dust and noise. Demolition of a house may take 2 to 5 days. As the affected houses are mostly made of corrugated roofs/walls, wood or temporary shelters, a certain amount of dust will be generated and noise from a temporary house would be negligible. Tree cutting by sawing machine would generate noise level up to 80dBA and the area affected would be within 20 - 30m diameter. Despite of relative large quantity of site clearance, the houses and trees are distributed scatter in 15 communes in 4 districts and towns thus the impacts of noise and dust from site clearance would be temporary, localized, at low and can be managed by avoiding sensitive hours such as late night, lunch break and student's hours.

Solid Waste Generation. Demolition of 141 houses (mostly temporary) and other structures for the subproject will generate demolished materials of concrete, bricks, wood, tiles, etc. and biomass of 5,391 trees, spreading over 15 communes (be done in form of "rolling"). Most of the demolition waste materials are suitable as fill materials and the affected households can produce wood fuel from the trees and compost from the rest of the waste vegetation materials and remaining wastes of demolition will be sold and no waste materials left in the construction sites.

These conditions result in the subproject having minor land clearance activities and therefore the emission of dust, gases as well as solid waste generation during this pre-construction phase will be limited.

Conclusion: Impacts of pollution caused by the subproject during the construction phase are small, because a small amount of houses and trees need to be demolished and in addition, the construction area is rural with a small population size.

3.2.2.2. Safety Risks related to Unexploded Ordnances (UXO)

The subproject area was suffered from wars in the past. Therefore, there could be a risk that some UXO may still remain underground. If not cleared, the UXOs may be exploded under the impacts of some construction activities and cause serious injury, even loss of lives and damages to the properties including construction equipment. UXO clearance has been proposed in the management plan will be done prior to construction commencement.

3.2.3. Negative impacts during the construction phase

3.2.3.1. Common Construction Impacts and Risks

Canal dredging, embankment and spillway lining, construction of pumping stations will cause common environmental impacts and similar risks, including:

- Noise, vibration, dust and exhaust gas emission;
- Generation of solid waste and wastewater

- Impacts on hydrology and drainage
- Increased erosion and land slide risks
- Disturbance to roadway and water way traffic, and increased traffic safety
- Biological impacts and risks
- Impacts on archaeological historical structures
- Social impacts and issues related to labour influx
- Safety risks for communities and workers.

a). *Noise, Vibration, Dust and exhaust gas emission*

(a1). Noise

The main sources of noise during the construction phase will be from the operation of equipment and construction plants used for dredging, construction/repair of sluice gates and pumping stations, lining of embankment and spillways such as excavator, tractor, leveling machine, boat tug, dredger, bulldozer, concrete mixer etc. Noise level generated from these equipment are listed in *Table 3.4* indicated that noise level within 1 m from any machine or construction equipment would exceed standard applicable to common areas. At distance from 20-50m, only noise levels from most equipment are below standard applicable to the common area but exceed that of the special area. For special areas, noise level meets standard only if the operating equipment or construction plant is at least 50m away.

It should be noted that the level of noise depends on the kinds of machinery and particular construction activities on the sites. In fact, mobilization of noise generation equipment will deeply rely on the construction activities undertaken on the site, which means that all the above equipment will not be mobilised at the same time. In addition, during the actual construction, some machine and equipment may be operated at the same time at the same location thus the level of noise at one specific location may be higher than the figures given in *Table 3.4*.

Table 3.4: Noise level generated from these equipment using for the subproject

No.	Facilities	Noise level at 1 m from source (dBA)		Noise level at 20m from source (dBA)	Noise level at 50 m from source (dBA)	Equipment used for
		Range	Average			
1	Backhoe excavator	72 - 84	78	52	44	Dredging
2	Tractor	77 - 96	86.5	60.5	52.5	
3	Excavator, leveling machine	80 - 93	86.5	60.5	52.5	
4	Boat for blowing dredger	85-96	88.3	61.3	53.2	
1	Bucket excavator	72 - 84	78	52	44	Culverts, pump stations, semi-embankment, spillways
2	Bulldozer	-	93	67	59	
3	Scraper, grader	80-93	86.5	60.5	52	
4	Truck	82-94	88	62	54	
5	Concrete mixer	75 - 88	81.5	55.5	47.5	

No.	Facilities	Noise level at 1 m from source (dBA)		Noise level at 20m	Noise level at 50 m	Equipment used for
6	Concrete pump	81- 84	82.5	56	48	2 big culverts
7	Pile driving hammer	81-115	98	82.4	65.6	
8	Welder	71 - 82	76.5	48.5	40	Culvert, pump station, semi-embankment, spillways
9	Compactor	74 - 77	75.5	48	39.5	
QCVN 26:2010/BTNMT for special areas from 6-21h		55 dBA				
QCVN 26: 2010/BTNMT for common areas from 6-21h		70 dBA				

The noise would impact directly construction workers on site and residents near or along the construction route. According to calculations, within 20 meters, noise intensity is evenly over 82.4dB. As this is the noise threshold, if humans are continuously exposed to such intensity, they will suffer from fatigue and unpleasant feelings. If noise exceeds 90dB, it will adversely affect hearing.

Noise from dredging: Most receptors are located farther than 50m from the construction sites. Such areas as the sites for the construction of dredging are all within 100-200m from the residential area (RA)s. From these distances, noise generated by various types of machines would smaller than 70 dB (QCVN 26-2010/BTNMT from periods of time from 06:00 am to 21:00). Impacts from noise can thus be assessed to be negligible. However, noise generated by night-time construction (21:00-06:00 am) can still exceed permitted limits. Therefore, mitigation measures would be needed for the workers on the construction site to avoid long exposure to loud noise and to reduce the noise level. The impact level of noise is assessed as being medium.

Noise from lining of embankment and spillways: There are some densely populated areas located in the north bank of Dong Tien canal (Tam Nong district), the east bank of Khang Chien canal in Phu Loi commune (Thanh Binh district) and Kho Be canal with the distance to the construction site of embankment and spillways of 5 to 10m. The reinforcement sites pass people's houses, which directly affects these households and noise is unavoidable. Noise will affect each area intermittently in about 3 months of construction of 4-5km dyke section. The impacts of noise would be more sensitive in the early morning and in the evening, can be managed by placing machines/equipment at least 20 m from houses and turn them off when not in use.

Noise from the construction of sluice gates and pump station: Hammer will be used for pile driving at two sluice gates of 5-m aperture on Ca Cai canal and Duong Gao canal. However, there have no residential areas or sensitive receptors within 20m, 50m from these sluices and the distance from Tram Chim NP to these sluice gate are about 8km, with these levels of noise would not affect/disturb on birds in the Park.

Noise from materials transportation: According to the calculations, to transport materials to construction sites requires 30 trips of barges (type 30 tons, for 1 coming time and 1 going out time). The types of material are mainly purchased from the central districts/towns such as Hong Ngu, Tam Nong, Thanh Binh and transported to the construction sites with an estimated

distance of 20km and the transport time is estimated 6 months for a culvert/pump station. The effect of the noise of vessels is in the form of the line (along the transport route) but the impact at 1 point on the transport route only appears in 1-2 minutes. In fact, the construction in rural areas is mainly in fields and the noise impact by the transport of construction materials is small and local. It is noticeable that

Conclusions: The impacts of noise caused by construction of the subproject are moderate negative impacts, and contractors need to be strict compliance with proposed mitigation measures during the construction phase.

(a2) Vibration

The construction process with the use of means and equipment can give rise to vibration in the earth foundation. Such vibration is transmitted along the earth environment but is strongly reduced in proportion with distance.

The levels of vibration generated by number of construction equipment are given in *Table 3.5* and *Table 3.6*.

Table 3.5: Levels of vibration caused by typical construction equipment

No.	Machine/Equipment	PPV at 7.62 m (mm/s)	Corresponding Lv at 7.62
1	Compression-type piling driver		
	+ High level	0.463	112
	+ Normal level	0.196	104
2	Rammer	0.064	94
3	Pile driving hammer	0.027	87
4	Big bulldozer	0.027	87
5	Driller	0.027	87
6	Heavy truck	0.023	86
7	Drilling hammer	0.011	79
8	Small bulldozer	0.001	58

Source: D.J. Martin. 1980, J.F. Wiss.1974, J.F. Wiss. 1967, David A. Towers. 1995

Table 3.6: Assessment of impact level caused by vibration

No.	Type of work	PPV (mm/s)	Approximate Lv (VdB)
1	Reinforced concrete, steel, wood (without plastic)	0.153	102
2	Technical concrete, normal mason works (without	0.092	94
3	Unprocessed wood and major mason works	0.061	98
4	Housing oversensitive to vibration	0.037	90

Source: Swiss Consultants for Road Construction Association, "Effects of Vibration on Construction" VSS-SN640-312a, Zurich, Switzerland, April 1992

Based on the results presented in *Table 3.5* and *Table 3.6*, the impact of vibration is mostly from the pile driving hammer and the safe distance for bearing strong impacts from vibration is about 10 meters from the generating source. During the construction phase, hammers are

only used for the construction of 2 sluice gates of 5m, however, there are no sensitive objects in this area. There are some houses within 10m of the construction site of lining of embankment and spillways, the majority of houses are corrugated iron roofs, not solid houses, so the vibration can cause risks of cracks and breakage.

In addition, 70m from the construction site of 3m sluice at Phu Thanh 3 Canal is Tram Chim NP, however, this is small ones, so only reinforcing foundation by melaleuca piles is required, therefore no significant vibration is generated.

Conclusions: The impacts of vibration caused by the construction of the subproject are moderate negative impacts, and there needs to be strict compliance with proposed mitigation measures during the construction phase.

(a3) Dust

Dust from soil excavation: Based on the environmental assessment sourcebook, Volume II, Sectoral guidelines, environment, World Bank, Washington D.C8 / 1991, dust emission from soil excavation is calculated by the emission coefficient (E) as follows:

Among them:

E: Pollution factor (kg/ton)

k: Average grain structure value (0.35)

U: Average wind speed in construction area (3.6 m/sec)

M: Average soil moisture (20%)

$$\text{Thus } E = 0.35 \times 0.0016 \times \left(\frac{3.6}{2.2}\right)^{1.4} / \left(\frac{0.2}{2}\right)^{1.3} = 0.0229 \text{ kg of dust/ton of soil}$$

The volume of dust coming from soil excavation and filling is calculated by the following formula:

$$W = E \times Q \times d$$

In which:

W: Amount of dust (kg);

E: Pollution factor (kg/ton);

Q: volume of soil excavation and filling (m³);

d: soil density (d = 1,5 ton/m³).

As dredged materials are wet, dust would be generated mostly from excavated materials and wastes. The volume of excavated materials in the subproject are presented in *Table 3.7*.

The total excavation volume of 21 culverts and 21 pump stations is 104,236m³. On average, one work generates 2,482m³ of excavated soil within the duration of 10- 20 days. If calculating the average of 15 days/work, the concentration of dust generated by excavation in the construction sites of culverts/pump stations is 5.6kg/day/work. This amount is not many as the excavation mostly takes place inner canals, along primary and secondary canals, where the soil is humid, surrounded by rice, etc. Only a few items of culverts/pump stations are located on RAs such as Thuong Thoi Hau A, Thuong Thoi Hau B in Hong Ngu district, on the patrol border, Kho Be RA, where behind is rice field. Dust is local in the construction sites and in the windward areas, which directly affects workers involved in the construction.

The total excavation volume of dike and spillway reinforcement is 345,482 m³. On average, one work of 100m long will generate 3,455m³ of excavated soil within the duration of 10 days. If calculating the average of 10 days/work, 11.8kg of dust will be generated each day along 100m of the reinforcement in the construction sites. This amount is high but the excavation mostly takes place along infield pathways and roads, therefore the impact is moderate. It is important to note that in some reinforcement sites, the population is crowded like the north bank of Dong Tien canal (Tam Nong district), the east bank of Khang Chien canal in Phu Loi commune (Thanh Binh district), and Kho Be RA. Dust only causes local pollution in the construction sites and in the windward areas, which directly affects workers involved in construction within the sites.

Conclusion: The dust pollution caused by excavation is moderate. In addition, managerial and technical measures to minimize dust pollution will be strictly enforced during the subproject implementation as presented in Chapter 4.

Table 3.7: Load of dust in the area due to soil excavation and filling activities

Items	Volume of excavated materials	Average excavated materials per site/section	Excavation duration (day)	Total load of dust (kg)	Daily average load of dust (kg/day)
Culverts and pump stations	104,236	2,482	15	85.2	5.6
Spillway and embankment	345,482	3,455	10	118.7	11.8
Total	449,718	5,937	25	203.9	17.4

(a4) Air emission

The main sources of SO₂, NO_x, CO, THC emission will be from: the exhausts of a) dredging equipment; b) boats and barges used for material transportation; and c) construction plants. Emission at volumes dependent on the amount of fuel consumed, configurations and status of the machines/equipment.

From dredging equipment

Up to 3 items will be used for each section of canal dredging (1 bucket excavator and 2 bucket chain excavators, or just one suction dredger). Emission can be calculated based on the volume of dredged materials as below. For 1.2 m³ bucket dredger, under the continuous operation, on average every 2 minutes it will finish one bucket of dredging sediment from canal bottom to the canal bank. Thus, one day (1 shift of 8 hours), it will dredge about 280m³. For 1200CV suction vessel, under the continuous operation condition, on average one day (1 shift of 8 hours), it will dredge about 1,000m³. The total dredging volume and dredging time in the canals in the subproject area are calculated in *Table 3.8*. Fuel consumption is calculated in *Table 3.9*.

Currently, in Vietnam's market, there is mainly diesel type 0.05%S; the emission of 1kg of this diesel at the temperature of 200°C is 38m³, the amount of diesel used by bucket dredger 1.2m³ is 34L/h and dredging vessel at the dump sites is 62L/h. Using WHO pollution coefficient and assuming the density of diesel is 0.835kg/L, the load and concentration of air pollutant are presented in *Table 3.10* and *Table 3.11*.

The calculated results show that the main source of air pollution is from by bucket dredger accompanying with other facilities as barge and tug.

Conclusion: Air pollution caused by the operation of dredging machines is small because this area is mainly in the field with good air quality, almost no inhabitants, and 2-3 workers for the dredging and this activity takes place over a short time (1-2 days). However, contractors need to strictly follow dust and noise pollution during operation of concrete mixing stations.

Table 3.8: Total dredging volume and dredging time

No.	Section	Length (m)	Volumne (m ³)	Time (day)
I	By suction dredger	22,040	271,858	272
1	Khang Chien canal (from Tan Thanh-Lo Gach to An Phong - My Hoa)	26,188	255,728	256
1.1	From K4+100 to K6+300	2,200	18,349	18
1.2	From K6+300 to K10+300	4,000	66,673	67
1.3	From K10+300 to K14+100	3,800	85,479	85
1.4	From K14+100 to K17+700	3,600	39,933	40
1.5	From K17+700 to K21+100	3,400	30,951	31
1.7	From K27+900 to K30+288	2,388	14,343	14
2	Khang Chien 1 canal	2,652	16,130	16
II	By bucket dredger	15,304	146,958	525
1	Khang Chien canal section from K0+000 to K4+100	4,100	59,092	211
2	Border canal from Hong Ngu town - Tam Nong (from 2/9 canal to Khang Chien canal)	3,550	30,419	109
3	Border canal Thanh Binh Tam Nong (from Khang Chien canal to Thong Nhat canal)	4,476	35,358	126
4	Ca Cai canal from Khang Chien canal to Hai Thang Chin canal	3,178	22,089	79
TOTAL		37,244	418,816	797

Table 3.9: Demand for fuel for the dredging in the subproject

No.	Dredging method	Number of equipment (item)	Fuel consumption (L/ship)	Time (day)	Total fuel using (L)
I	By sucking				
	Suction dredger 1200CV	3	500	91	95,150
II	By bucket				
	Bucket dredger 1,2m ³	3	270	175	99,225
	Barge	3	201	175	73,868
	Tug boat	3	201	175	73,868
	Total				342,110

Note: The operating frequency of bucket dredger and suction dredger is 0.7, other equipment is 0.3 (most of the time is waiting for the next dredging)

Table 3.10: Total amount of pollutant load generated from dredging machines

No.	Dredging machines	Pollutant						
		Aldehyde	CO	Hydrocarbon	NO _x	SO ₂	SO ₃	Dust
Emission factor when using diesel (kg/T of diesel) (WHO 1993)		0.24	0.24	0.24	8.56	0.93	0.01	1.78
		Total load (kg)						
1	Suction dredger	19.1	19.1	19.1	680.1	73.9	0.8	141.4
2	Bucket dredger 1.2m ³	19.9	19.9	19.9	709.2	77.1	0.8	147.5
3	Barge	14.8	14.8	14.8	528.0	57.4	0.6	109.8
4	Tug boat	14.8	14.8	14.8	528.0	57.4	0.6	109.8

Source: Rapid Environmental Assessment, WHO, 1993

Note: Weight percent of sulfur in the fuel is 0.05%.

Table 3.11: Pollutant concentration generated from the dredging

No.	Dredging machines	Pollutant concentration (mg/s)						
		Aldehyde	CO	Hydrocarbon	NO _x	SO ₂	SO ₃	Dust
1	Suction dredger	0.81	0.81	0.81	28.94	3.14	0.03	6.02
2	Bucket dredger 1.2m ³	0.44	0.44	0.44	15.64	1.70	0.02	3.25
3	Barge	0.33	0.33	0.33	11.64	1.26	0.01	2.42
4	Tug boat	0.33	0.33	0.33	11.64	1.26	0.01	2.42

From a concrete mixing plant. During the construction in each culvert or each 100m length of lining, one 500L concrete mixer will be arranged with a fuel level of 28.8 L/shift for the construction. The plants mainly produce noise and gaseous from diesel engines. The forecast of the gaseous and dust from the mixing plant is calculated in *Table 3.12*.

The concrete placement for these activities will take place in about 10 days. Thus, the air emission from the plant at each culvert/pump station or 100m length of lining is shown in *Table 3.13*.

Most culverts/pump stations are located in a field, outside RAs, except a few culverts/pump stations are located on RAs: Thuong Thoi Hau A, Thuong Thoi Hau B (Hong Ngu district) along the patrol border, Kho Be culvert near Kho Be RA. Most reinforcement sites are located in fields, far RAs, except a few reinforcement sites located on RAs: the north bank of Dong Tien canal (Tam Nong district), the east bank of Khang Chien canal in Phu Loi commune (Thanh Binh district) and some locations crossing Kho Be RC.

Conclusion: Air pollution caused by the operation of concrete mixing stations is small because small concrete mixing plants will be used. There are only some people reside within 100m of this process, and 2-3 workers for the operation of a concrete mixing station and the activity takes place over a short time. However, contractors need to strictly follow dust and noise pollution during operation of concrete mixing stations.

Table 3.12: Air emissions from the 500L concrete mixer

No	Pollutant	Emission factor (kg/T of diesel)
1	Aldehyde	0.24
2	CO	0.24

No	Pollutant	Emission factor (kg/T of diesel)
3	Hydrocarbon	0.24
4	NO _x	8.56
5	SO ₂	4.67
6	SO ₃	0.07
7	Dust	1.78

Source: EPA, Dinh Xuan Thang, 2007 (S in DO is 0,25%)

Table 3.13: Estimate the number of toxic emissions from the concrete mixer for 100m of reinforcement/1 culvert in one day

No.	Pollutant	Emission factor (kg/T of diesel)	Load for 1 day (kg/day)	Total load for 1 culvert/100m of reinforcement (kg)
1	Aldehyde	0.24	0.007	0.069
2	CO	0.24	0.007	0.069
3	Hydrocarbon	0.24	0.007	0.069
4	NO _x	8.56	0.247	2.465
5	SO ₂	4.67	0.134	1.345
6	SO ₃	0.07	0.002	0.020
7	Dust	1.78	0.051	0.513

From material transportation

The subproject area has a dense system of rivers, canals, which is convenient for transportation of materials by waterway, including sand, stone, cement and machinery.

Lining embankment and spillways will use onsite filling soil so the impact will be within the construction site at the distance of <50m. For the 13,505m³ shortage of filling soil for construction activities in Hong Ngu and Thanh Binh districts will be exploited at the disposal sites along Khang Chien canal to minimize transportation impact and cost. As a result, the impact of dust and gaseous is moderate.

Other materials are filling sand, steel, stone, etc. that need to be transported to the sites from other places about 37,030 tons for 43 culverts/pump stations and 87,678 tons for 79.91km embankment and spillway lining. Materials are mostly purchased from the central districts and towns to the construction sites with an estimated traveling on the distance of 20km and during 6 months for the construction items. With the emission coefficient of diesel-powered boats and barges as shown in Table 3.14 the dust and air emission generated by the material is shown in Table 3.15.

Table 3.14: Estimate trips of material transportation for the subproject construction

Item	Volume of materials to be transported (T)	Loads of vehicles/boats (T)	Number of trips (trip)	Average number of trip per day (trip)
1. Culverts/ pump stations				
1.1. For 43 culverts/ pump stations	37,030	30 T	1264.2	6.88
1.2. For 1 Culvert/ pump station	882		29.4	0.16
2. Embankments and				

spillways				
2.1. For 79.91km	86,678	100 T	879.01	87.90
2.2. For 100m	109		1.1	0.11

Table 3.15: Load of dust and air emission from materials transportation of the subproject

Item	Bụi	SO ₂	NO _x	CO	VOC
1.For 1 culvert/pump station					
Total load (kg)	1.294	1.176	67.032	8.702	2.822
Average daily load (kg/day)	0.007	0.007	0.372	0.048	0.016
2.For 100m lining					
Total load (kg)	0.048	0.044	2.508	0.326	0.106
Average daily load (kg/day)	0.005	0.004	0.251	0.033	0.011

Transportation of excavated soil after reuse for the subproject: The amount of residue excavated materials from the culverts and pump station is 2,677m³ and each culvert/pump stations exceeds about 100-200m³ of excavated soil and this soil is reused for the reinforcement of adjacent semi-dikes within the sites from 100-200m by 10-ton truck in the period of 10-20 days. It means that only 1-2 truck for residue soil a day.

Conclusion: Air pollution caused by transporting construction and residue excavated materials is moderate, however using water transportation for bulk goods will reduce the amount of dust generated. Technical measures and management to minimize pollution from dust will be applied strictly in the process of implementing the subproject as per Chapter 6.

(a5) Locations most sensitive to dust, noise and vibration

Table 3.16 indicates the areas possibly affected by noise, dust and exhaust gases.

Table 3.16: Specific receptors affected by noise, dust and exhaust gases

No .	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
I	Hong Ngu District		
1	Cau Mong Market	0.27	Cay Dua Sluice
II	Hong Ngu Commune		
1	Binh Thanh Primary School	0.25	Strengthening spillway of Binh Thanh 2 Canal, bordered with Tan Thanh – Lo Gach (2 banks)
2	An Binh B Primary School	0.20	Strengthening spillway: Khang Chien canal bordered with Hong Ngu-Vinh Hung Canal (the east bank)
III	Tam Nong District		
1	Tram Chim National Park	0.07	Culvert + West bank Pump Station of Phu Thanh 3 Canal (Thong Nhat) (Compartment No.13)- (combined irrigation culvert)

No .	Name of receptors	Distance to the nearest construction (km)	Note: nearest construction
2	Phu Thanh B Primary School	0.17	Strengthening semi-dyke: the east bank of Khang Chien canal (bordered canal of Hong Ngu town-Tam Nong and Thanh Binh-Tam Nong)
3	Phu Thanh A Wharf	0.05	Strengthening semi-dyke: the north bank of Dong Tien canal (from Hai Thang Chin canal to Thong Nhat canal)
4	Phu Thanh A High School	0.19	Strengthening semi-dyke: the north bank of Dong Tien canal (from Hai Thang Chin canal to Thong Nhat canal)
5	Phu Thanh A CPC	0.15	Strengthening semi-dyke: the north bank of Dong Tien canal (from Hai Thang Chin canal to Thong Nhat canal)
6	Phu Tho CPC	0.2	Strengthening semi-dyke: the north bank of Dong Tien canal (from Hai Thang Chin canal to Thong Nhat canal)
IV	Thanh Binh District		
1	Phu Loi Primary School	0.05	Strengthening semi-dyke: the east bank of Khang Chien canal (from Duong Gao Canal to bordered canal of Tam Nong)
2	Phu Loi Secondary School	0.05	Dredging the Khang Chien Canal (from Tam Nong-Thanh Binh Canal to An Phong-My Hoa Canal)
3	Health Station of Phu Loi Commune	0.05	Dredging the Khang Chien Canal (from Tam Nong-Thanh Binh Canal to An Phong-My Hoa Canal)

b). Solid waste generation, including hazardous wastes

Solid waste generation includes four main types depending on sources: (i) excavated and dredging materials from canal and construction sites, (ii) construction wastes; (iii) domestic wastes from worker's accommodation; and (iv) hazardous wastes.

Excavated and dredging materials

The volume of dredged materials and excavated materials of the proposed work items are presented in indicating that relative large volume of dredged and excavated materials will be generated, at **622,875 m³**. While some excavated materials will be reused for back filling, the remaining will need to be disposed of (*Table 3.17*). The subproject selected 11 sites with a total land area of 21.66 ha for disposal of dredged and residual excavated materials. As discussed in Chapter 2, soil in the subproject area do not have heavy metals and low contain acid sulfate soil, therefore wastewater from the excavation of foundation pits for will have no significant impact on the soil quality and agricultural production around the sites.

Table 3.17: Total volume of excavated and dredging materials

N o.	Work Item	Volume (m ³)	Reuse (m ³)	Disposal (m ³)	Note
1	Canal Dredging	418,816	0	418,816	
2	Sluice Gates and Pumping Stations	53,456	53,456	0	50,779 m ³ used for sluice gates and pumping stations and 2677 m ³ for embankments and spillways
3	Embankments and spillways	150,603	150,603	0	
	Total	622,875	203,875	418,816	

Construction wastes

The process of excavating, backfilling and reinforcing the embankment surface will generate construction solid wastes as soil, cement bag, iron and steel scraps, stone, debris, etc...

The soil dropping during the embankment backfilling: the volume of backfill soil droppings during the excavation and covering is moderate and the impact from this waste to the environment is identified as moderate.

Construction waste: includes cement bags, iron and steel scraps, construction stones and sand, is the waste from up to 200,000 cement bags, all is to be collected and not littered in the environment especially the canals.

Clearing of shrubs and plants on the old embankment route: this is carried out for soil excavation. The plants in this area are mostly shrubs and are not much in quantity so the construction units must proactively clear and clean the old embankment surface for soil extraction. Though the risk of any environmental impact of the materials is low, the construction teams must treat the waste properly never dumping any into the canals to cause flow clogging or to affect the water environment.

Domestic wastes from camps

As estimated that each worker on site discharges an average of 0.4kg of domestic waste daily. Most of the waste is easily biodegradable, there are also some non-degradable wastes such as packaging materials including plastic bags, plastic bottles...). The volume of domestic wastes generated by the workers of each work item and the entire subproject are estimated in Table 3.18.

Table 3.18: Domestic waste generation of the subproject

No.	Work Item	Number of sites (site)	No. of Workers at each site (person)	Wastes generated from each site/day (kg)	Construction duration at each site (day)	Total volume of domestic wastes (kg)
1	Canal Dredging	372	6	1.8	3	1,674
2	Culvert and Pumping	43	4	1.2	180	9,288

	Stations					
3	Embankments and Spillways	799	4	1.2	10	9,588
	Total	1,214	14	4.2	-	20,550

The total amount of generated domestic waste from entire subproject is 20.55 tonnes for 4 years of construction. Without proper management, such amounts of generated domestic waste would become a polluting source, giving rise to bad smells and pathogenic factors from microorganisms. However, the workers will be located at 1,214 different construction sites and each site only generates from 1.2 to 1.8kg of domestic waste (equivalent to the domestic amount of 1-2 households in the area), and therefore, If the waste management is good, the impact level is assessed to be low.

Hazardous waste and materials

Hazardous solid waste are mostly oil contaminated materials. As regulated in the Circular No.36/2015/BTNMT issued on 30 June 2015 of MONRE, they include empty fuel and lubricant boxes, cans, asphalt, petrol, fuels, paints, and other hazardous solid waste such as light bulbs, battery, etc from worker camps. The volume of hazardous waste depends on the number of mobilized equipment/machinery and based on monitoring experience from many construction sites it is expected that only a small amount of hazardous waste will be generated. Other kinds of hazardous waste include batteries, wastes contaminated by printing inks, etc. with a small amount (about 5 kg/month/work) expected. However, these are not be generated at the construction sites but in operational offices, worker camps and maintenance areas. Discharged oil and oily contaminated waste from regular maintenance also are identified as hazardous wastes.

The level of pollution of the lubricant on the water source is very large due to the extent of their spread on the water surface, the ability to decompose slowly, which creates a membrane separating the water and the air environment, preventing oxygen diffusion into the water source which will directly affect the aquatic fauna, especially aquatic animals, shrimp and fish. This oil can also be attached directly to aquatic animals and in large amounts can cause death.

The amount of generation is estimated as i) the amount of oil discharged from equipment oil change for one time is 7 liters; and ii) frequency of maintenance is 230 work shifts (*Table 3.19*). Hazardous waste is expected to be of average volume, and it could create serious negative impacts on the environment, and therefore will be collected, transported and treated by a licensed agency according to the provisions of the Hazardous Waste Management.

Conclusions: The negative impacts of domestic and construction solid waste, and hazardous wastes are moderate. The subproject owner and contractors must apply measures to mitigate impacts during the construction phase.

Table 3.19: Summary of solid and hazardous wastes generated from construction activities

No.	Hazardous waste	Discharged oil (L)	Oily drags (kg)	Containers, packaging materials (kg)
1	Dredging	840	250	50
2	Culverts and pump stations	602	903	602
3	Embankments and Spillway	168	240	168
	Total	1,610	1,393	1,010

c). *Wastewater generation*

Wastewater generated during the construction phase include: i) domestic wastewater from workers' accommodation; ii) construction wastewater, mainly from equipment washing.

Wastewater from worker camps. Per capita worker's water demand is prescribed in QCXDVN 01:2008/BXD at about 45 liters/person/day including water for washing, cooking and personal hygiene. The amount of wastewater generated is calculated as 80% of the water used daily. Thus, the amount of domestic wastewater generated is about 2.7m³/day for 75 workers.

Table 3.20: Summary of wastewater from worker

No.	Construction site	Number of workers (people/day)	Total volume of water use (m ³ /d)	Volume of wastewater (m ³ /d)
1	Dredging	30	1.35	1.08
2	Culverts and pump station	20	0.9	0.72
3	Embankment and spillway	25	1.125	0.9
	Total	75	3.375	2.7

Content of wastewater includes suspended solids, oil, and grease, high concentrations of organic matter, residue, dissolved organic matters (through the BOD₅, and COD indicators), nutrients (Nitrogen, Phosphorus) and microorganisms. World Health Organization (WHO) pollutant emission estimates for developing countries are shown in *Table 3.21*. The estimated average concentration of pollutants in the domestic wastewater before treatment through septic tanks are listed in *Table 3.22*.

Based on the pollution load, a number of workers and wastewater flow, we calculate the pollutant concentration in wastewater by the following formula:

In which:

- C: Pollutant concentration, (mg/L)
- C₀: Pollutant load, (g/day)
- Q: Wastewater flow, (m³/day)

Comparing the pollutant concentrations in untreated domestic wastewater with the QCVN 14:2008, Column B, most of the parameters exceed the standard (*Table 3.23* and *Table 3.24*). To minimize the impact, the investor should require the contractor installing mobile toilets inside the construction area to serve the needs of the labor activities. Therefore, the amount of domestic wastewater is collected and be treated by the local treatment system, hence, the impact is low.

Table 3.21: Pollutants loads of domestic wastewater (untreated)

No	Pollutants	Pollution factor (g/person.day)	
		In developing countries like Vietnam	Vietnam
1	BOD ₅	45 - 54	50
2	COD	72 - 102	85
3	TSS	70 - 145	100

No	Pollutants	Pollution factor (g/person.day)	
		In developing countries like Vietnam	Vietnam
4	Total N	6 - 12	9
5	Total P	0,8 - 4	2.5

Source: WHO, 1993.

Table 3.22: Pollutants concentrations of domestic wastewater

TT	Pollutants	Concentration (mg/l)
1	BOD ₅ (20 ⁰ C)	450 - 540
2	TSS	700-1450
3	TN	60-120
4	TP	20
5	Microorganism Total Coliform Fecal coliform	(MPN/100ml) 10 ⁶ -10 ⁹ 10 ⁵ -10 ⁶

Source: Hoang Van Hue, 2012.

Table 3.23: Performance of treatment of pollutants on septic tanks or similar works

TT	Pollutants	Performance of treatment (%)
1	BOD ₅	50
2	COD	45
3	TSS	65
4	Total N	70
5	Total P	75

Source: Institute of Natural Resources and Environment, 2005.

Table 3.24: Pollution loads due to subproject construction

TT	Pollutants	Pollution load (kg/ngd)	
		Untreated	Treated by septic tank
1	BOD ₅	12.25	6.13
2	COD	20.83	11.45
3	TSS	24.50	8.58
4	Total N	2.21	0.66
5	Total P	0.61	0.15

Wastewater from barges. Barges will be used to transport materials for the subproject construction of 2 sluices at Ca Cai canal (barges of 100T) and reinforcement of semi-dikes and spillways (barge of 100 to 200T). Wastewater coming from the barges is estimated at about 1-1.5m³/day for 2 sluices construction and 2 to 4 m³/day for reinforcement of semi-dikes and spillways. Factors causing water pollution of waste water is grease, suspended solids, organic matter, nutrients (N, P) and microorganisms.

Wastewater from operation and maintenance of construction equipment and machinery. This kind of wastewater contains organic substances, oil, and suspended solids. The wastewater, generated from regular maintenance, includes: i) machine maintenance (about 4 m³/day); ii) machine cleaning (about 7m³/day); iii) machine cooling (about 2m³/day).

However, the volume of water supply required for this purpose on the site is heavily dependent on the compliance and operations of the contractors (*Table 3.25*). To prevent drainage from reaching water bodies, equipment and truck maintenance areas will be captured and treated.

Table 3.25: Pollutants generated from operation and maintenance of construction equipment and machinery

Source of wastewater	Volume (m ³ /day)			Concentration of pollutant (mg/l)		
	Dredging	Culvert/ Pump station	Embankment and spillway	COD	Oil and grease	SS
From maintenance	2	0.5 - 1	0.5 - 1	10-15	-	25-40
From cleaning	4	1 -1.5	1 -1.5	20-32	0.4-0.8	60-80
QCVN08-MT:2015/ BTNMT (column A)				10-15	0.1-0.2	20-30
QCVN08-MT:2015/ BTNMT (column A)				30-50	0.1-0.3	50-100

d). Impacts on Water quality

Impact on the water environment caused by the dredging

Impacts of dredging on surface water quality would be the most important environmental concern of the Subproject. Bottom sediment will be disturbed and suspended solids will be spread into the water. The dredging process affects the following environmental components:

Sediment disperse and deposition: The dredging affects the aquatic life of some species. The most direct impact is the removal of substrates including benthic organisms and suffocation of invertebrates and loss of their habitat. There are also other impacts associated with dredging due to the effects of suspended solids on aquatic life. A number of experiments and studies on the impact of suspended solids on aquatic life have been made. For example, DOER (2000) reviewed these studies and related evidence of suspended solids related to dredging. The study found that at the high turbidity of the suspended solids, eggs and larvae of fish are one of the most sensitive species to the level of suspended solids in water. A group of free-swimming creatures like fish is able to swim out of highly disturbed areas. The sediment particles deposited on the bottom or dispersed make the creatures move out of the area due to loss of stable habitat. The crustacean species are almost unaffected by sedimentation caused by dredging because sedimentation level affects more than 10,000 mg/l (DOER 2000). The disturbance increases the decomposition of organic matter by microorganisms. Oxygen in the water reduces the immediate impact on aquatic organisms, indirectly affecting aquatic resources. The high concentration of suspended solids in water due to prolonged dredging will limit sunlight to the water layers, affecting photosynthesis of algae, seaweed, moss, and irritating fish (As small particles into gills cause asphyxiation. The hydrological regime in the region (tidal currents, flows) also has a significant effect on sediment dispersion. This increases the turbidity of the water.

The rehabilitation of the dredging areas: The estuarine experiences are used as reference materials to assess the rehabilitation periods of the dredging areas. Among the available data on the rehabilitation of riverside benthic organisms, the notable materials are the USACE and USEPA scientific reports. According to the USACE report, if the substrate is stable at a small and average speed, the recovery time of a dredging area will be less than 5 years. The measurements from the US EPA relating to the restoration in the dredging areas in Alaska river shows that the restoration of the biodiversity of invertebrates is determined after one

year (AM Prussian et al. 1999). The reports in the world relating the coastal dredging show that the rate of restoration of the benthic organisms after dredging that loss their habitat varies greatly (Nedwell & Elliot 1998; Newell, Seiderer & Hitchcock 1998). The recovery rates and habitat are listed in *Table 3.26*.

Table 3.26: Recovery time observed in the dredging areas

No.	Name of the dredging area	Habitat	Recovery time
1	Coos Bay, Oregon	Sludge is often disturbed	4 weeks
2	Cagliari Bay, Sardinia	Canal mud	6 months
3	Mobile Bay, Alabama	Canal mud	6 months
4	Goose Creek, Long Island	Lagoon mud	>11 months
5	Klaver Bank, North Sea	Sand - gravel	1-2 years
6	Chesapeake Bay	Mud - sand	18 months
7	Lowestoft, Norfolk	Gravel	>2 years
8	Dutch coast	Soil	3 years
9	Boca Ciega Bay, Florida	Seashell-sand	10 years

Source: Nedwell & Elliot 1998; Newell, Seiderer & Hitchcock 1998 in http://www.ukmarinesac.org.uk/activities/ports/ph5_2_2.htm#a1

The general observations show that the fastest rate of recovery appears in estuarine areas where smooth sediment is disturbed and opportunistic species predominate. In general, the recovery period increases in stable sand and gravel areas, where there are long-lived species with complex biological interactions that control the structure of the dominant organisms.

The study in the polluted estuarine area in the North East of England indicates that the recovery period of the benthic community is more than 6 months (M.P. Quigley and J.A. Hall, 1999). The Study in a small dredged area (2,625m²) in a similar environment at the North African port of Ceuta also indicates that it took about six months for the disturbed area to be re-structured to allow the benthic communities to recovery to the same level as in the undisturbed region (Jose M Guera-Garcia et al., 2003). The duration of dredging is calculated based on the total volume of dredged sediment, at 418,816m³ and the capacity of dredger as shown in *Table 3.27*.

Because 1.2m³ bucket dredger has a small capacity, the construction time is longer and produces more suspended solids in the water than blowing dredger. According to the calculations, if each mean of construction is in charge of one dredging section, the construction by bucket dredger will be longer although the construction volume is much smaller than the section of the suction dredger.

Table 3.27: Total dredging volume, area and dredging time

No.	Section	Length (m)	Volumne (m ³)	Time (day)
I	By suction dredger	22,040	271,858	272
1	Khang Chien canal (from Tan Thanh-Lo Gach to An Phong - My Hoa)	26,188	255,728	256
1.1	From K4+100 to K6+300	2,200	18,349	18
1.2	From K6+300 to K10+300	4,000	66,673	67
1.3	From K10+300 to K14+100	3,800	85,479	85

1.4	From K14+100 to K17+700	3,600	39,933	40
1.5	From K17+700 to K21+100	3,400	30,951	31
1.7	From K27+900 to K30+288	2,388	14,343	14
2	Khang Chien 1 canal	2,652	16,130	16
II	By bucket dredger	15,304	146,958	525
1	Khang Chien canal section from K0+000 to K4+100	4,100	59,092	211
2	Border canal from Hong Ngu town - Tam Nong (from Hai Thang Chin canal to Khang Chien canal)	3,550	30,419	109
3	Border canal Thanh Binh Tam Nong (from Khang Chien canal to Thong Nhat canal)	4,476	35,358	126
4	Ca Cai canal from Khang Chien canal to Hai Thang Chin canal	3,178	22,089	79
Total		37,244	418,816	797

The dredging experiences from other areas show that the dredging affecting range is highly dependent on the flow velocity and flow rate. In the dry season, the flow at Khang Chien canal and some canals in the subproject area range from 9 to 17 m³/s. At this rate, the spread can range from 1 to 3km. Although the construction equipment by 1.2m³ bucket dredger and 1200CV suction dredger minimize the disintegration of the sediment in the water environment in the narrow areathe duration is extended, therefore the environmental impact is considered average and local. This effect will end when the dredging operation is finished.

At dredging sites of the subproject area, the dredging cross-section only accounts for about 10% of the cross-sectional area of the dredging canals, the surrounding organisms can move to the newly dredged area. Therefore, basicall, the benthic organisms can recover around 4-8 weeks after dredging.

The surface water will be affected longer if using bucket dredger. Accordingly, Khang Chien canal section from K0 to K4+100 (the section between Tan Thanh - Lo Gach canal with Hong Ngu - Vinh Hung canal) will be mostly affected. Along Hong Ngu - Vinh Hung canal in Binh Thanh commune, Hong Ngu town, there are many aquaculture ponds, especially those who raise Pangasius (catfish). In addition, there is a shrimp farming area in Cu Lao Chim in Phu Thanh B commune, Tam Nong district. Therefore, there should be a concentrated construction solution, speeding up the construction of these locations to minimize the impact on these areas.

Impact on the water environment from the disposal sites

As mentioned above, there are total of 7 disposal sites to be selected for dredging along Khang Chien and Khang Chien 1 canals, it is quite convenient to use suction dredger to suck sediment into dump sites, in which 05 dump sites are currently earth ponds, which were exploited for filling residential areas, namely dump sites: 3a, 3b and 3c at Kho Be residential area, 01 dump site at Ca No residential area, and 01 dump site at Khang Chien residential area. 2 others will be embanked to +5.2m to store dredged sludge (*Figure 3.2*). In addition, at 04 locations of canals that use bucket dredger, sediment is contained in the compartments to ensure that it does not overflow to surrounding paddy fields (*Figure 3.3*). Most of the disposal sites are surrounded by rice fields, 5 sites located near/behind the residential area. Details of disposal sites are shown in *Table 2.47*.

During the dredging process, a large amount of water is pumped up with the sediment into the dump sites. Water from the dredging site containing high suspended solids is the risk of affecting the quality of the receiving source without good deposit.

The references to the analysis results of the water quality of the outlet of the dredged canal of Nguyen Van Tiep (Km 113 + 500) in My Dong commune, Thap Muoi district and the end point (Km 143 + 500) in Phong My commune, Cao Lanh district are presented in *Table 3.28*. The results show that the water quality of the outlet has the TSS from 9 to 25 times higher than that of the standard: QCVN 40: 2011/BTNMT.

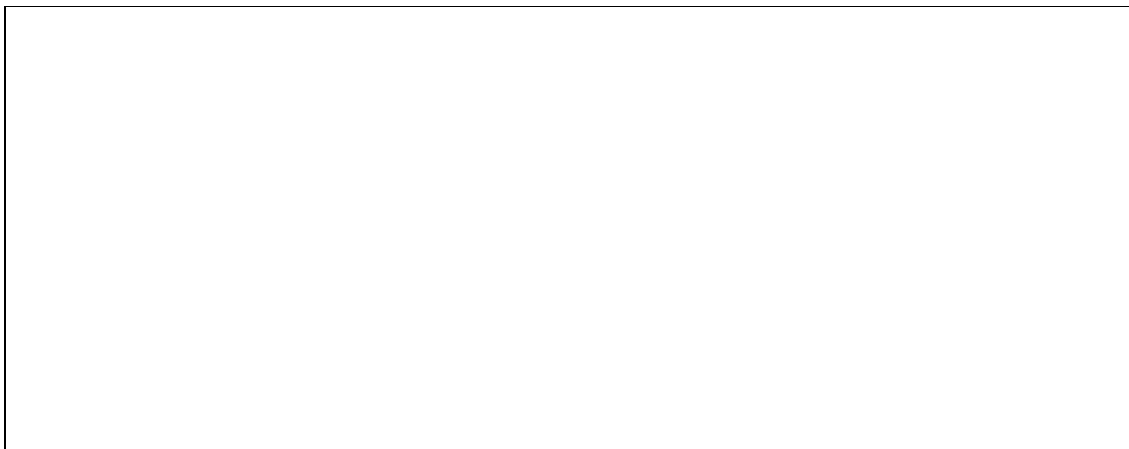


Figure 3.2: Typical cross section in disposal sites for suction dredger

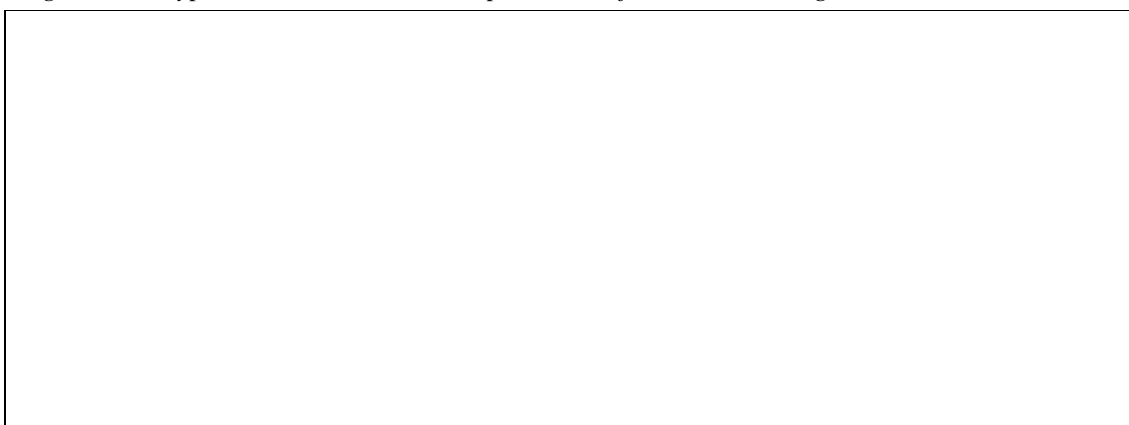


Figure 3.3: Typical cross section in disposal sites for bucket dredger

Table 3.28: Water quality of at the outlet of the disposal site for dredging Nguyen Van Tiep canal

No.	Section	Parameter				
		T ⁰ (°C)	pH	DO (mg/l)	SS (mg/l)	F.Coli MPN/100ml
1	SRA-114	27,5	6,9	2,2	1700	620
2	SRA-116	27,5	6,7	2,1	1800	700
3	SRA-118	29	7,2	3,5	1600	420
4	SRA-120	29,5	7,2	2,2	2220	530
5	SRA-122	27,1	6,42	3,26	1920	250
6	SRA-124	29	6,31	4,17	1580	420
7	SRA-126	29	6,5	3,9	1900	370

8	SRA-128	30,5	6,32	3,29	1660	340
9	SRA-134	32,9	6,9	4,6	1950	260
10	SRA-136	33,6	6,95	4,79	1520	180

Source: Project of Transport Development for the Mekong Delta - WB5.

e). Impact on hydrology and drainage

Impact on hydrology and drainage due to construction culverts, pump stations: As the characteristics of the subproject area is the upstream flood area and the annual amount of water flow is very large. The flood water levels in the fields rise. Therefore, the construction of culverts will mainly in dry season. Each construction item of culverts, pump stations will be constructed within no more than 6 months to avoid floods. The excavation and filling are usually carried out in early dry season, therefore the impact of rainwater runoff during the construction of foundation pit is negligible.

Impact on hydrology and drainage caused by dredging: The dredging does not require diversion of water flows. The dredging cross-section is quite smaller than the water cross-section in the areas, thus, the construction is not large enough to affect the water flows but helps open up and increase the flows at dredged locations.

Impact on hydrology and drainage caused by reinforcing embankments and spillways: Due to the characteristics of the subproject area, which is upstream flood area. The amount of water from floods is very large, making the flood water level in the fields rise, therefore the construction of culverts will mainly in dry seasons. Each of the reinforcement routes will be carried out in less than 6 months to avoid flooding. The earthworks for reinforcement of August dikes and spillway are usually carried out in early dry season, therefore the impact of rainwater overflow during construction of dike and spillway reinforcement is low.

Impact when canal sections are blocked for embankment lining: The construction of the head of the canal does not block the flow, in the process of lining the canal heads only the excavation of the foundation pit to the level of +0.5 is exposed to canal water, stretching from 80-200m depending on the hardening of the canal head. After that, the piles will be driven with a density of 16 piles/m² and the foundation pits will be poured by concrete to level + 1.0m. In addition, this activity occurs completely in the dry season, when the water level at the canals is low, close to the water level in foundation pit, the entire roof and road surface are completed constructed on the ground, so the impacts on water quality are considered low and local, ending soon after the concreting of pits are completed.

f). Biological Impacts

Impacts on Tram Chim National Park:

As mentioned above, there is a culvert combined pump station of 2.5m (Phu Thanh 3 Canal) will be built 70m from Tram Chim NP. This construction is likely to affect Tram Chim NP including dust, noise, vibration, waste, exhaust gases and mobilization of workers, construction works.

According to a research conducted by USFWS Wildlife Conservation Society on the impact of noise on wildlife, declines in densities of woodland and grassland bird species have been shown to occur at noise thresholds between 45 and 48 dB, respectively; while the most sensitive woodland and grassland species showed declines between 35 and 43 dB, respectively. Songbirds specifically appear to be sensitive to very low sound levels equivalent

to those in a library reading room (~30 dBA) (Foreman and Alexander 1998). However, the culvert construction has the highest noise level of 90dB, calculated by the distance of 70m from the construction site to the national park, the impact of noise to birds is small (*Figure 3.4*).

Beside, mobilization of construction worker will cause illegal hunting wild life species and cutting forest trees for their food to the Park. However, there have only 4-5 workers to build this culvert within 6 months, so the impact is assessed as low and the contractors will have a measure to manage this impact.

Figure 3.4: Attenuation of construction noise from the culvert at Phu Thanh 3 canal

Impact on the aquatic ecosystem:

- From dredging: Given the aquatic ecosystem in the subproject area, especially in the dredged canals, are the most common species in the Plain of Reeds. There are no species in the Red Book which are at risk of extinction and need protection. Dredging canals will inevitably affect the benthic fauna in the dredging areas. However, the dredging areas are very small compared to the areas of the canals and the organisms are able to migrate to non-dredged areas and recover after 1-2 months. The impact on the aquatic ecosystem is not great and there is no risk of widespread impact on the surrounding areas.
- From the transportation of materials for construction: As mentioned above, the construction of culverts, pump stations, embankments and spillways related to the water environment is the transportation of materials for construction. The transport of construction materials takes place in a long time that requires the average number of vehicles of 6 trips/day only for 1 culvert/pump station and 1.22 trips/day for 100m of the lining. With such a volume of transport, its impact on the aquatic life is small. However, the source of waste that may affect the aquatic ecosystem is a hazardous waste (machine lubricant, viscosity). If the construction units do not take proper solutions to control this source in accordance with the regulations to emit large amounts of hazardous waste into the environment, the risk of damaging aquatic ecosystem will be massive deaths in the water. This is what the Subproject Owner, as well as the construction units, must closely control the waste source.

Impact on other animals and plants: The vegetation cover in the subproject area is not natural but is people's long-term cultivation area, which is not a wildlife habitat. The animals are mainly birds, mice, toads, frogs, etc. The vegetation here is mainly growing along canals, ditches, gardens, yards, earth ponds where the soil is exploited for filling residential areas, and paddy fields, thus the impact on the natural vegetation and wildlife and the ecosystem is considered very small and temporary and without affecting the outside the construction sites.

g). Impacts and risks on historical and cultural heritages

Construction activities may affect religious and cultural structures such as pagodas or temples by dust, noise, and vibration, disturbing traffic or access to these works, or cause visual impacts or a nuisance if construction materials and wastes are loaded improperly. Loud noise may also affect religious procedures.

There are also no important historical and cultural sites identified in the subproject construction sites. However, during construction, there might be chances that historical or cultural artifacts would be found. The procedures for addressing these situations are included in the chance find procedures in Chapter 6.

h). Waterway transport disturbance and safety risks

From dredging

The canal dredging is mainly implemented on the water surface and does not require transport of sludge to disposal sites.

At the sections where contractors use canal banks to dump sludge like K0 + K4 + 100 of Khang Chien canal, and canals of Hong Ngu-Tam Nong, Thanh Binh - Tam Nong and Cai Cai, only 1 barge and 1 tug boat are increased to the construction sites and each location takes place more than 2-3 days.

In Khang Chien and Khang Chien 1 canals, Contractors will apply the blowing method that sucks sediment directly at canal bottom via discharge pipes to pump sediment to dumping sites at the maximum distance of 1700m. This method does not require vessels/barges for transporting sediment and increase only one dredger in each area which appears no more than 2-3 days. Therefore, there is no change in the water environment in this area compared to the current status.

In dredging areas that maintain regular operations, there will be certain affection to the boat navigation. The results of the field survey and based on the dredging sections, some major impacts from construction to the waterway are identified as follows:

- Local transport jam of boat and barges on the regional flow.
- There may be a collision causing a risk of unsafety to the navigation on the canals.

Therefore, without good navigation signing, control and regulation, a collision between other ships/boats with dredging barges are quite possible. When an accident occurs, damages will be considerable, for example, loss of material and property, affection of construction progress and circulation of ships/boats on canals, and even loss of human life.

However, as mentioned in section 2.1.2.1.b, as the cross section of Khang Chien canal is quite large, ranging from 40-50m, other boats are still able to navigate. For branch canals like Hong Ngu-Tam Nong, Thanh Binh-Tam Nong, and Ca Cai, the cross-section is smaller at 20-30m where there are small boats to sail.

In the field, the means of transporting agricultural products and production equipment are mainly small vessels, ranging from 3 to 10 tons (2-3m wide and 5-10m long), so these boats will be passing easily while dredging.

In horizontal canals such as Tan Thanh - Lo Gach, Vinh Hung - Hong Ngu, Dong Tien, An Phong - My Hoa, etc. are major canals for transportation of big vessels, boats of 150-1,000 tons so adding 1 suction dredger will no impacts on waterway transportation (see *Figure 2.3*).

Therefore, the impact on the waterway is low and can be minimized through a traffic safety plan on canals is proposed in *Chapter 4*.

From culverts and pump stations

Most culverts/pump stations are small with an aperture of 1.5-5.0m which are mainly built on infield canals that connect to major canals in the region. The construction is mainly inland, thus the construction impact on navigation is negligible.

We can see that Hong Ngu district is the area where many culverts and pumping stations are built (18/43 culverts and pumping stations). These will help to perfect the irrigation infrastructure for the area, thereby improving production efficiency for the people. The construction will take place in parallel with the production process so it will inevitably affect the production activities of people. However, all sluices and pump stations will not be built at the same time, but in each item and in one area of the canal system. Therefore, in the same area, many construction items will be arranged in order to minimize the impact on the production of people (*Figure 3.5*).

Figure 3.5: Sluices and pump stations and canal system in Hong Ngu district

The main affection to water navigation is the transportation of construction materials. As calculated in *Table 3.14* above, each culvert/pumping station is built in 6 months which requires about 30 trips of 30-T barges to transport construction materials in the routes in *Figure 3.7*. As a result, this activity will increase the average waterway traffic by 6 days per trip in the construction area of each culvert/pumping station. However, all culverts/pump stations will not be constructed at the same time but will be phased into 4 years. Each year about 10 culverts/pump stations in 4 districts/towns in the subproject area are built. As a

result, for the construction of 10 culverts/pump stations, the total volume of waterway traffic will increase by 1.6 voyages/day.

From semi-dikes and spillways

It should be noted that at the culverts/pump stations there is the construction of other working items like reinforcement of dikes and spillways, dredging Khang Chien canal and its branches, the navigation density will accumulate and the impact will increase. Therefore, the mitigation measures described in *Chapter 5* should be applied.

About 20 km of semi-dikes and spillways lining will be built each year. According to the calculations *Table 3.14* above, for every 100 meters of lining, it will increase 0.11 trip, so within six months of the dry season, the lining will increase 22 trips of boat a day.

As such, the total number of trips of boats will increase by 23.76 trips a day during the dry season. However, these work items are spread over four districts/town. So in each district/town, the number of boat trips increased during the dry season to transport materials for the construction of public works is 6 trips/day, equivalent to about 1 hour/trip (due to the construction day). The subproject area has a dense canal system so it is very convenient to transport materials by waterway. Therefore, the impact of the transportation of materials during construction is assessed as moderate and this activity will have to apply the mitigation measures mentioned in Chapter 5.

Figure 3.6: Boat/barge transporting materials in the subproject area

Figure 3.7: Transportation routes for construction materials of the subproject

i). Road way transport disturbance and safety risks

From dredging

The subproject construction mainly takes place on the surface water with the total length of 37,244km of canals. All construction equipment and materials are transported by waterway, thus, negative impact during construction does not appear on roads.

However, during pumping sludge by suction dredgers from the dredging area to 7 dump sites, the pipelines will cross into the roads along the canals causing traffic disruption (*Figure 3.8*). However, this impact happens in a short time and localized.

The sections where canal banks are used for dumping sediment at site like K0 + K4 + 100, Hong Ngu-Tam Nong canal, Thanh Binh - Tam Nong canal, Ca Cai canal with the length of 15.3 km are only small, low embankments, which are soil paths of 0.8-1.5m wide with low elevation of +2.0 to +3.0m and do not meet the elevation of August dikes. In these sections, the traffic is mainly on the opposite sides (which meet the elevation of August dikes and the roads are filled with macadam and are reinforced). Therefore, the dredging construction does not affect the local traffic in the region and the impact is small and localized.

Figure 3.8: A pipeline of the suction dredger cross into a road

In addition, using suction dredgers will temporarily remove bridges with clearance elevations below the high of dredgers (up to 4-5m) or careless of workers will impacts on the bridges leading to interruption local people movement or agro products transportation.

For five concrete bridges, this effect will not occur. For 14 iron and timber bridges, most of them have clearance elevations of 5-7m and the agricultural products in this area are usually shipped by waterway, however, the dredging in these areas are only about 5-7 days so the impact on traffic is small (*Figure 3.9*). Contractors will, however, apply measures in Chapter 5 to mitigate this impact.

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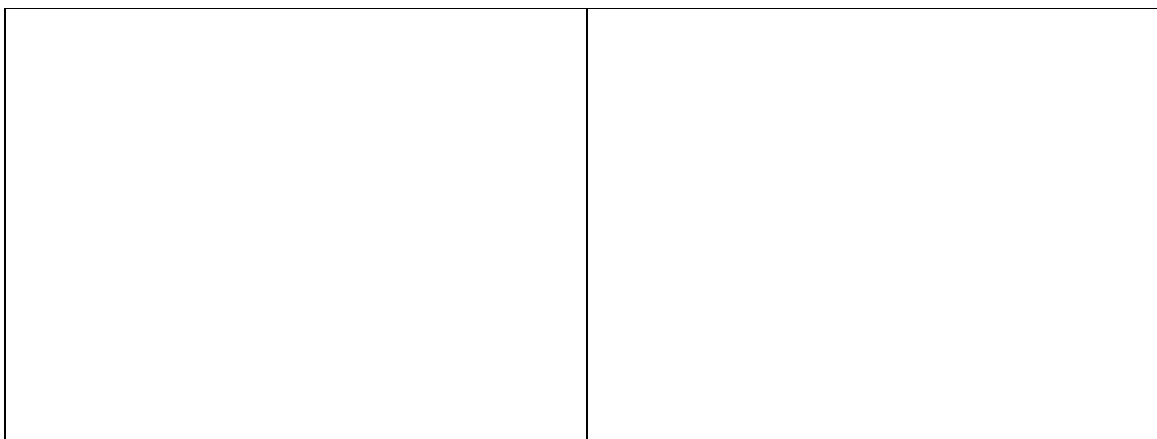


Figure 3.9: Typical suction dredger and iron and timber bridges along the dredging routes

From culverts and pump stations

Most drainage/pump stations are built on infield pathways/trails along major canals as Thong Nhat, Tu Thuong, Khang Chien, Muong Lon, Dong Tien, etc. In the infield trail, the number of people moving is not high but when the construction units do not take solutions to make temporary paths or suitable direction for people, it can generate social concerns from people. However, most canals have two banks, one side is soil trail but another is stone or concrete or asphalt road that people are able to move when there is construction on soil trail, it will be active to organize for people's smooth movement. The Subproject owner and the construction companies must have detailed traffic coordination plan to ensure that the construction does not affect the movement of people. With the above characteristics, the level of impact from construction activities to road traffic is determined to be small.

Separately, at the culverts/pump stations along the border patrol in the communes of Thuong Thoi Hau A, Thuong Thoi Hau B of Hong Ngu district, including Muong Vop pumping station, Nam Muc sluice, Chin Hue pumping station, Ca Cai culvert combined pumping station, which is close to the main roads and residential areas with crowded traffic and transport means, the constructio, as well as the transportation of materials, will not avoid impact on the traffic in the 2 communes above.

Therefore, means of transport and construction should be avoided peak hours to prevent traffic congestion and residents' daily activities. At the same time, when transporting materials across the roads to the works, it is necessary to send regulators and traffic instructions to minimize the impact.

Figure 3.10: Typical layout of 3-m culvert under construction

From semi-dikes and spillways

The reinforcement will affect the traffic of people living near the sites, for example the residential areas in the north coast of Dong Tien canal (Tam Nong district), in the east bank of Khang Chien canal, Phu Loi commune (Thanh Binh district) and some locations passing through the residential areas like Kho Be residential area. The remaining routes are located in the field, far from residential areas.

Therefore, at the construction sites, it needs to make way for people. The contractors can construct half way by half way to not impede the movement of the people.

j). Social impacts and labor influx issues

The subproject involves will mobilize 75 workers per day working over a period of up to 4-years on diverse construction activities. This causes the potentially negative social impacts of labor influx including: (i) conflicts arising from increased demand on/use of existing infrastructure, services and utilities, including transportation, health, education, water and sanitation, waste management, public utilities and community, religious, and recreational facilities and loss of land for access routes; (ii) increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity; (iii) increase in gender-based violence, including sexual harassment and sex with underage children, deriving from the dramatic rise in the characteristic of labor influx - men, money, movement (influx), and mixing (i.e., social interaction); (iv) increases in communicable diseases, including respiratory problems, diarrheal diseases, vector-borne diseases (e.g., malaria), and sexually transmitted infections (e.g., HIV/AIDS, syphilis, gonorrhea, chlamydia, hepatitis B); and (v) child labor. However, these construction workers were mobilized in 15 communes of the province. The influx of workers at the site will increase demand for food, entertainment and therefore pushing up the trading and services in the region to develop. Services established will satisfy the demand for normal life and livelihood of workers, officers working at the site. This will help to solve the demand on job and increasing income to local residents. In addition, depending on the ability of local working force, they will be selected to work at some subproject components and get paid. At subproject components where requiring simple work or work will be done by manual method: cutting tree, transporting rock, soil material by simple vehicle, watering to cure concrete, preparing the foundation excavation, grassing at dam abutments, etc... the Contractor and sub-contractors shall be allowed to hire local labor to perform such a work. People who are hired to work at the site will have the chance to learn new technology, get familiar and know how to operate machine and vehicle. Gradually their knowledge will be improved and they will be a positive and efficient factor affecting knowledge, to cultural, spirit life of local residents.

k). Safety and health risks for the community and the workers

Occupational safety and worker health. Construction activities incur the occupational risk of employee injury or mortality. The following sources could create a high risk of accident: UXO at construction sites; electric shock and electrocution while conducting excavations such as from encountering power cables. Common diseases in the subproject area include flu, dengue fever, hand-foot-mouth, digestive diseases, pinkeye, and scarlet fever to be recognized frequently. The worker may get the risk of being affected by these diseases. Besides that, if workers get infected, their illness may be spread to others including the local people. In addition, workers may get sick because of unsafe living conditions, unsafe food and inappropriate personal protection equipment (PPE).

Conclusions: Impacts caused by unsafe working conditions are considered as moderate negative impacts during the construction phase. It is important to implement mitigation measures to ensure safety for all workers, local communities and ensure the planning of emergency responses if accidents happen.

Fire and explosive emergencies. Emergencies of fire and explosion could be incurred through fuel storage and unsafe use of electrical equipment. The consequences are extremely adverse and could cause injuries, disabilities and loss of life. The reasons for fire and explosion are (i) unsafe or inappropriate firefighting systems and management at fuel storage areas on construction sites; (ii) electric generator supplying energy for machinery, equipment could cause electrical incidents resulting in fires; (iii) use of heating equipment could cause fire or occupational accidents such as burns.

Conclusion: The emergencies are a moderate negative impact. Because these emergencies could occur any time thus it requires a specific emergency preparedness and response plan to be in place at the construction site as well as appropriate equipment to minimize the probability of these emergencies.

Waterway incidents. Because almost all the materials will be transported by water, accidents can occur due to boats colliding during the travel to the work sites. These incidents can cause serious impacts to the environment, especially to the water quality, such as increasing turbidity by stirring the river and canal bed on contact or through oil spills from engine damage.

It is notable that waterway accidents in Khang Chien canal, especially the risk of vessel collision when passing through the dredged areas as the canal is one of the major flood drainage and important navigation axes in the area, the area of material yards, large culverts such as Ca Cai canal adjoining An Phong - My Hoa canal and Duong Gao canal. The above incidents may affect human life, property (boats) and the construction (collision of the means of construction dredging and transportation of materials). Oil may be dispersed into the environment when vessels and means of construction are wrecked, polluting the water environment and aquatic organisms and the use of water in production and daily life.

Conclusions: The emergencies are a moderate negative impact because there likely is a low frequency of occurrence. However, if an accident happens during the construction phase it could create a significant impact on habitat, people and properties. Therefore, an appropriate rapid response plan is needed to ensure the management of emergencies.

3.2.3.2. Specific impacts and risks related to dredging

Besides general impacts which happen in all investment projects, implementing the subproject also cause specific impacts, depending on specific types of construction, types of background conditions and type of construction methods of the subproject area.

As the background of the dredging area is that affecting by acid sulfate soils and some areas along the canal dredging area aquaculture, and using earth ponds for disposing of dredged sludge, so dredging in this subproject causes specific impacts including:

a). Impacts on aquaculture in relation to reduced water quality

As mentioned above, one of the background conditions of the subproject area is the focal large number of aquaculture households, which is dominant with commercial catfish culture along big canals like Vinh Hung-Hong Ngu, Tan Thanh-Lo Gach, An Binh, Dong Tien. Giant freshwater prawn farming is concentrated in Cu Lao Chim, Phu Thanh B commune, Tam Nong district. The dredging will increase the water turbidity that affects the water intake for aquaculture in the above areas.

For catfish, the replacement of water is frequent with a cycle of about 10 days/batch with a water change of 30-50% of the water in a pond.

For the Giant river prawn culture, now farmers tend to reduce changing water to limit disease. The water source is usually supplied at the beginning of flood season to avoid polluted water due to stem rots. If possible, replace water equal to 20-25% of surface water in the afternoon. If the water clarity is below 50cm, it needs to change the water and fill CaCO_3 or $\text{CaMg}(\text{CO}_3)_2$ with 100-300kg/ha. With this fertilization, the impact of dredging activities on shrimp farming can be minimized.

As such, the increase in turbidity in the water will affect the aquaculture water change, especially the catfish aquaculture due to a large amount of water to be changed. Therefore, there should be concentrated construction solution to speed up the construction progress at the locations near the aquaculture areas and announce the dredging schedule in order that people can make a plan for changing water to minimize the impact on these areas.

With the above characteristics, given that only good construction time is achieved, the impact of dredging on aquaculture is small and it is controlled when constructors comply with the dredging schedule and the mitigation measures in Chapter 5.

b). Risk of erosion along banks of canals due to dredging activities

Basically, the dredging work will take place on the existing elevation to the elevation of -3.0m. Except for the sections from K21+100 to K27+900 of Khang Chien canal, where the natural elevation is lower than the designed elevation, which is no need to dredge, in other sections of Khang Chien canal and its branches, the elevation ranges -0.7m to -2.90m and the common is -1.6 to -2.5m. Thus, in Khang Chien canal, it needs to dredge 0.1 - 2.3m deep and the common dredging depth is 0.5 to 1.4m deep, the bottom width is 8.0m, the slope coefficient is $m = 1.5$ (Figure 3.11). For branch canals, the depth requires deeper dredging from 1.5m, the bottom width is 4.0 m, the slope coefficient $m = 1.5$ (Figure 3.12).

The dredging cross-section area of Khang Chien canal ranges at 5- 30m² and the typical is 10 to 12m². For the branch canals, it is 12 to 19m².

Accordingly, the dredged area accounts for a very small portion, only 10% of the cross-section area of the dredged canals. Thus the possibility of occurrence of bank erosion in the construction process seems to be very small.

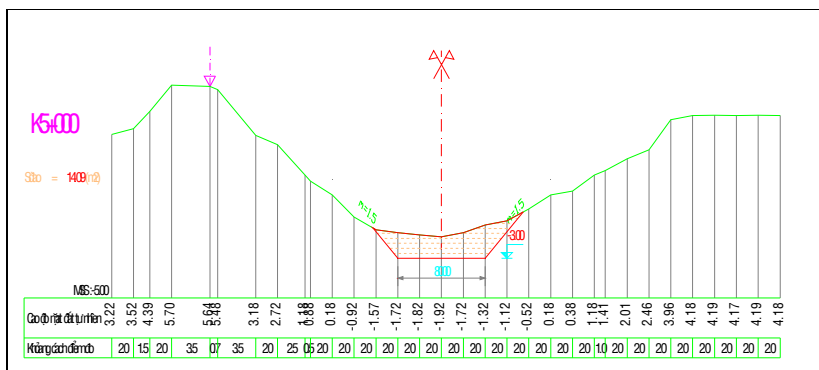


Figure 3.11: Typical cross section of Khang Chien canal dredging by blowing dredger

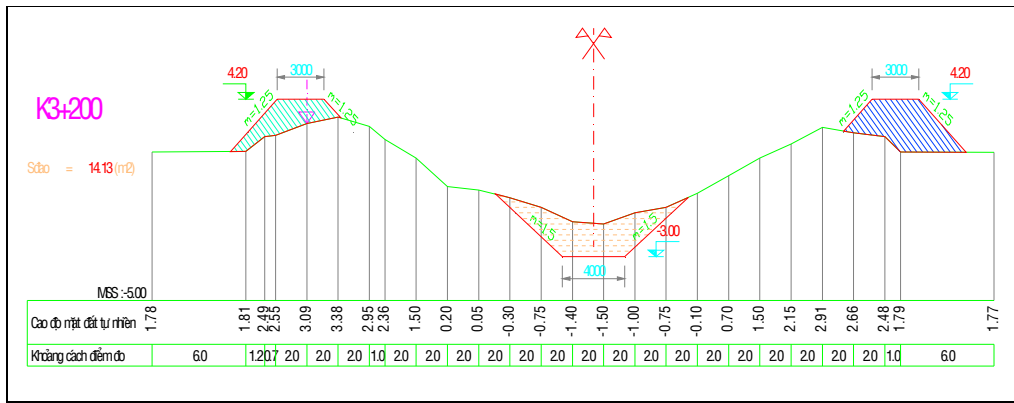


Figure 3.12: Typical dredging cross section by backhoe dredger

c). Impacts and risks at disposal sites

Embankment break the sludge disposal sites

As mentioned above, total volume of sludge disposal is 418,816 m³, in which 271,858m³ dredged by suction dredger and stored in 7 disposal sites along Khang Chien and Khang Chien 1 canals, in which 05 dump sites are currently earth ponds, which were exploited for filling residential areas, with depths ranging from 8-10m (Figure 3.13); and 2 others will be embanked to +5.2m to store dredged sludge (Figure 3.2). It is easily for suction dredgers to assess to these sites.

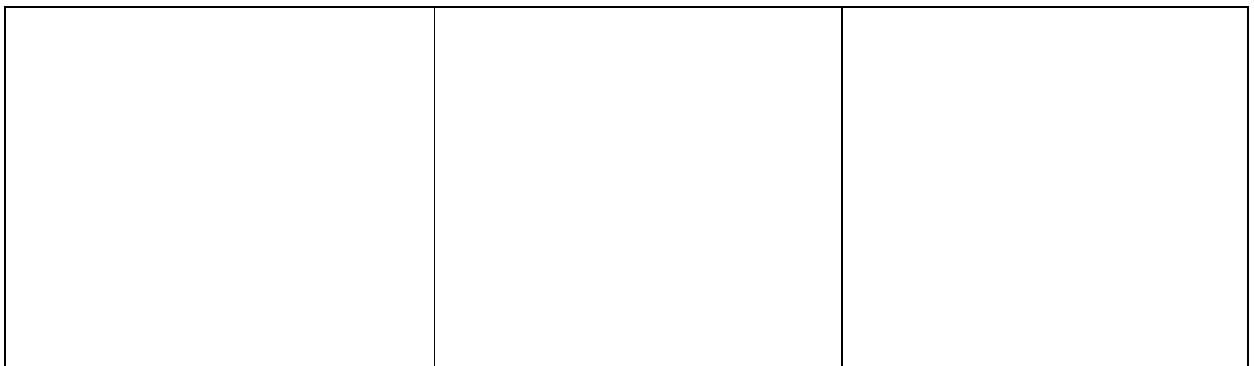


Figure 3.13: 05 dump sites make use from the earth ponds

In addition, at 04 locations of canals that use bucket dredger, sediment is contained in the compartments to ensure that it does not overflow to surrounding paddy fields (Figure 3.3).

It means that dredged sludge is stored in the dump with the height enough. However, in the event of unexpected incidents, all dredged sludge in the dump-sites will overflow into canals and paddy fields affecting the surrounding production area, increasing the turbidity of suspended solids in water, especially in the areas where there is aquaculture like Cu Lao Chim in Tam Nong district and Pangasius farming areas. In addition, the increase of suspended solids in the water will directly affect the aquatic animals and plants in the area.

Comments: The embankment break at dredged sludge dump-sites is low and mainly occurs from dredging flood drainage canals but when the incident occurs, its impact is very large and sudden and difficult to cope. Therefore, the Subproject Owner must have a positive preventive plan as well as an emergency response plan to manage the incident as it occurs.

Acid sulfate soil

Dredging may expose acid sulfate soil but the analysis result of sediment samples in Chapter 3 show that sediment is slightly affected by acid sulfate. Should acid soils be encountered

they could seriously affect the surrounding land through acidic run-off from the removed soil. The acid may kill soil-dwelling organisms, plants and fish. However, sediment from dredging is stored in the earth ponds or compartments.

Sediment in the run-off from stockpiles may smother adjoining farmland when improperly stockpiled during the wet season and emit a foul odour that may cause a nuisance to nearby residents. The acid can also produce aggressive soil conditions detrimental to concrete and steel. Dredged sludge after being pumped into dump sites, when there is rain, it does not significantly affect the outside but appears in sediment compartments because the compartments are reinforced by embankments at the elevation of +5.2m high and 3.0m wide (Figure 3.2 and Figure 3.3). If good management not to let water drain out, the impact is considered negligible and local. Hence, acid from acid sulfate soil may not be a serious problem in the dump sites.

3.2.3.3. Specific impacts and risks related to embankment lining

a). Disruptions to irrigation/ drainage services

As mentioned above, the construction of the head of the canal does not block the flow, so there are no disruptions to irrigation/ drainage services in the area.

b). Risk of erosion due to embankment and spillway lining

The excavation work is mainly related to the foundation pit at the bottom of the slope to prevent erosion, the depth of excavation at these locations to the elevation of 0.5 m, then proceed to reinforce the foundation with cajuput piles and concrete the foundation pit to elevation + 1.0m. As mentioned above, excavation of the foundation pit to the level of +0.5 is exposed to canal water. After that, the piles will be driven with a density of 16 piles/m² and the foundation pits will be poured by concrete to level + 1.0m. In addition, this activity occurs completely in the dry season, when the water level at the canals is low, close to the water level in foundation pit, the entire roof and road surface are completed constructed on the ground, so the risk of erosion is low.

3.2.3.4. Specific impacts and risks related to sluice gate and pumping station construction

a). Risk of erosion/landslide due to the construction of culverts and pump stations

The culverts are mainly small (with the aperture of 1.5-3.5m) and located on the embankment of the field canals and depth of pit excavation of 2.0m so the risk of erosion is low. Only 2 culverts of 5.0m in Thanh Binh district require in-water construction and the pit excavation to the elevation of -3.0 may cause a landslide. In order to limit the risk of erosion and to affect the flow of water in the area, the 2 culverts are constructed in coffer dams, thus significantly reducing the impact on the surrounding area. In addition, the upper and lower roofs have reinforced during the construction of the culverts and pump station. Therefore, the risk of erosion is minimized.

The pumping stations are built on the earth surface with a depth of pit excavation lower than 1.5m. Before the concrete pits were poured, the reinforced concrete piles and reinforced concrete piles at these sites were reinforced. So the risk of erosion is small.

b). Flooding when water is pumped out of the foundation

As the characteristics of the subproject area are the upstream flood area and the annual amount of water flowing is very large. The flood water level in the fields rises. Therefore, the construction of culverts will mainly in the dry season. Each construction item of culverts,

pump stations will be constructed within no more than 6 dry months to avoid floods. The excavation and filling are usually carried out in early dry season, therefore the impact of rainwater runoff during the construction of foundation pit is negligible. In the rainy season, construction sites and machinery, as well as workers' camps, should be properly arranged to minimize the discharge of pollutants in wastewater into canals and especially into rice fields in the downstream of the culverts/pump stations.

c). Specific issues related to the construction of 18,400m of medium voltage lines

The subproject will repair some existing pump station and build some new pump stations, which need to install electricity grids for them.

Detailed the medium voltage lines need to be installed is showed in *Table 1.2* and *Table 1.3*. From the tables, there are 7/39 pump stations with medium voltage lines available for use, 32/39 other pumping stations need to be connected to the 22 kV medium voltage grid. The medium voltage power grid in the subproject area has basically been invested and developed to the subproject communes. Therefore, the medium voltage power supply for the subproject pump stations only needs to install a wire from the communes to the pump stations.

There are 17/32 pump stations with distances less than 300m from medium-voltage lines, 14/32 stations with a distance less than 1,000 m and the longest distance to the line is Bay Den pump station (2000m).

The activities of installing medium-voltage lines are normal activities in the area. All lines are built in the poles, the area occupied by the poles is very small (about 1 m²/pole), the pole routes are mainly along with the traffic routes so there will be no effect of land acquisition as well as no significant environmental impact in the area. However, the subproject area is a flood prone area as well as low infrastructure conditions, so if all lines not managed well from the time of construction will be a potential impact on people's health. As such, the subproject owner should have a plan for managing the lines in both design and operation phases to ensure the requirements specified in the grid safety.

3.2.3.5. Site-specific impacts

Table 3.29 summarizes site-specific impact and risks of the subproject.

Table 3.29: Site-specific impacts on each sensitive receptor

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
I	Dredging canal		
1	Khang Chien canal from Tan Thanh – Lo Gach to An Phong – My Hoa		
1.1	From km 4+800 to Km 8+600	Kho Be residential route is about 700m long	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting local people's health - Traffic disruption where the pipelines of suction dredger cross over the road to the disposal site - Traffic disruption where the bridge having clearance elevation lower than the height of the suction dredger - Impact on aquaculture due to high

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
			turbidity - Traffic safety risks to the community, especially at night - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
1.2	From Km 12+400 to Km 20+600	Ca No RA with the length of 250m	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting local people' health - Traffic disruption where the pipelines of suction dredger cross over the road to the disposal site - Traffic disruption where the bridge having clearance elevation lower than the height of the suction dredger - Impact on aquaculture due to high turbidity - Traffic safety risks to the community, especially at night - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
		Phu Thanh B Primary and Secondary School	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Lessons affected by noise and vibration
1.3	Km 25+00 to Km 30+300	Khang Chien residential route with the length of 1km	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting local people' health - Traffic disruption where the pipelines of suction dredger cross over the road to the disposal site - Traffic disruption where the bridge having clearance elevation lower than the height of the

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
			suction dredger - Impact on aquaculture due to high turbidity - Traffic safety risks to the community, especially at night - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
		Health Station of Phu Loi Commune is 50m far from the section	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting patients' health - Conflicts between construction workers and patients and their families
		Phu Loi Secondary School is 50m far from the section	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Lessons affected by noise and vibration
II	Sluices and pumping stations		
2.1	Muong Vop pump station	The residential route of Thuong Thoi Hau A commune, Hong Ngu town	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation
2.2	Chin Hue pump station, Dau Ca Cat culvert and pump station, Nam Mung culvert	The residential route of	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
		Thuong Thoi Hau B commune, Hong Ngu town	<ul style="list-style-type: none"> - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation - Impact on taking water for production - Increase the risk of incidents
2.3	Kho Be culvert	Kho Be residential route, Hong Ngu town	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation - Impact on taking water for production - Increase the risk of incidents
2.4	Bay Muoi Hai culvert and pump station	The residential route of An Binh B commune, Hong Ngu town	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation - Impact on taking water for production - Increase the risk of incidents
2.5	Ong Nhon culvert and pump station	Pangasius	Fish death due to water pollution

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
		pond	
2.6	Culvert and pump station at the west side of Khang Chien	Shrimp ponds	Shrimp death due to water pollution
2.7	Phu Thanh B culvert and pump station	Tram Chim National Park	<ul style="list-style-type: none"> - Vibration caused by the construction - Illegal entry of construction workers to cut trees and shoot birds
2.8	Ho Dau pump station	Phu Loi Secondary School, 50m far from the station	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Lessons affected by noise and vibration - Vibration caused by the construction machinery may affect wall, the gate of school - Risks of traffic and works accidents to teachers and students
III	Embankment and spillways		
I	Spillways		
1.1	Ca Sach, Coi Dai and Coi Tieu spillways	Reinforcing head of Ca Sach canal,	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students'

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
		near RA of Thuong Thoi Hau A, Hong Ngu district	<p>health</p> <ul style="list-style-type: none"> - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Increase waterway incidents
1.2	Ca Cat, Nam Mung culverts and pump stations	RL of Thuong Thoi Hau B	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impacts on waterway transportation
1.3	Hai Thang Chin canal	Hai Thang Chin RA	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
			<ul style="list-style-type: none"> - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
1.4	Thong Nhat canal	Thong Nhat RA	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
2	<i>Embankment</i>		
2.1	West bank of Khang Chien	Kho Be residential cluster	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Vibration caused by the construction machinery may affect houses - Impact on road traffic - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
2.2	East bank of Khang Chien canal (from Hong Ngu – Tam Nong to Thanh Binh – Tam Nong)	Ca No RA	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Vibration caused by the construction machinery may affect houses - Impact on road traffic

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
			<ul style="list-style-type: none"> - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
2.3	East bank of Khang Chien canal (from Duong Gao canal to Tam Nong border canal)	Khang Chien RL, Phu Loi commune	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Vibration caused by the construction machinery may affect houses - Impact on road traffic - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission
IV	Disposal Sites		
1	Site No. 3a, 3b, 3c	The dump site makes use of the earth pond that has been exploited to fill the Kho Be RA in 2 communes of An Binh A and An Binh B, Hong Ngu Town so it is located just behind Kho Be RA	<ul style="list-style-type: none"> - Risk on subsidence and landslide for residential areas around this area - Odor from dredged sludge - Increase turbidity in canals due to discharged water from the disposal site
2	Site No. 5	The dump site makes use of the earth pond	<ul style="list-style-type: none"> - Risk on subsidence and landslide for residential areas around this area - Odor from dredged sludge

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks
		that has been exploited to fill the Khang Chien RA in Phu Loi commune so it is located just behind Khang Chien RA	- Increase turbidity in canals due to discharged water from the disposal site

3.2.4. Negative impacts during the operation phase

3.2.4.1. Accessibility to water surface after the embankment is lined

Currently, people in the project area use water for living and production through culverts and pump stations. The embankment in the region is identified as the August embankment with the purpose of preventing early floods to protect production in combination with the open culverts, underground culverts, pump stations and spillways at the head of main canals people can take initiative to collect and drain water at late flood seasons to promote production. So after lining embankment will not effect onthe accessibility to the water surface of the local people.

3.2.4.2. Impacts on the increasing use of agrochemical

It should be noted that the choice of crop rotation must be appropriate, which do not require too many pesticides, even rice. At the same time, a cultivation process is not too complicated to minimize economic risk factors.

Thanks to the system of August flood control as semi-embankments, culverts, sluices, pump stations, spillways, the flood time will be slower and more stable. People are peaceful to have enough time to grow another cash crop or rice crop, etc. after the W/S crop. The production of rice under IPM and aquaculture under VIETGAP standards will increase the soil nutrition, reduce pests, reduce the amount of fertilizer for rice in the next crop and increase profits for farmers.

Thanks to the rotation with other crops or other aquaculture models instead of specialized rice cultivation as before, it contributes to the reduction of pest and disease outbreaks in the next crops as well as reduces the use of plant protection chemicals in the next crops.

3.2.4.3. Impact on hydrology and water quantity

The embankment in the regionis identified as the August embankment with the purpose of preventing early floods to protect production in combination with the open culverts, underground culverts, pump stations and spillways at the head of main canals people can take initiative to collect and drain water at late flood seasons to promote production. During main

floods, the dikes will be flooded and flood water is drained via spillways into fields and culverts to increase flood drainage and develop the livelihoods in the direction of flood exploitation. As a result, the subproject basically neither prevents main floods nor changes the flood situation compared with the current status of soil dikes. The only difference is that thank to the strengthened dikes (reinforcing of dikes, construction of open culverts, underground culverts, and spillways), people will actively bring flood water into their fields at beginning flood seasons, store and take initiative in draining flood water at ending flood seasons to reduce damages compared to the current soil dikes.

3.2.4.4. Damage of culverts

Risks and incidents occurring during the operation of the works are largely due to subjective reasons and sometimes objective reasons. The main causes of risks and incidents are as follows: (i) the quality of construction works initially does not guarantee the technical quality; (ii) improper operation of the works; (iii) the regular maintenance and repair do not conform to the regulations; (iv) failure to fully comply with the operational procedures for the maintenance and repair of culverts.

Damage of culvert gates which cannot operate opening and closing will cause a great impact. It can be said that if it fails to open and control the flood water in the water storage apartments to serve natural fish and other types of aquatic culture in flood season, giant freshwater shrimp, etc. it will greatly affect production and economy and loss production instability. The risk of this damage is very small, however, once it occurs, it will mainly affect the production and cause loss of income if there is not timely remediation.

3.2.4.5. Damage of semi-dike landslide, and sedimentation

Apart from culvert damages, there may be problems of semi-dike and spillway landslides. When large annual floods come, the dikes will be flooded for two to four months. In spite of being hardened with concrete, the risk of landslide may occur because the subproject area is located in the upstream flood area which has strong waves and winds. The spillway routes will be similar, which are main works of flood water intake for the main drainage canals in the area, therefore it is unavoidable that the risk of annual landslide may be too strong to collapse embankment and affect production and the floodplain livelihood models inside the water storage apartments.

Dredging Khang Chien canal and a number of canal branches will increase the flood drainage capacity in the area but increase the risk of a landslide along canals as well as sedimentation after a period of operation. Infield small canals will be at risk of sedimentation after several floodwater storage seasons in the storage apartments to maintain livelihood development.

The risk of this occurrence may occur annually and the Subproject Owner should conduct annual monitoring to minimize the impact of the incident.

3.2.4.6. Traffic accidents

Traffic accidents damage property and lives because vehicles do not meet technical requirements or drivers do not concentrate or fail to comply with the traffic rules on the reinforced dike road (77.47km). However, this problem can be prevented by installing traffic signs on the road and encouraging people to strictly follow the traffic rules and using quality vehicles, etc.

3.2.4.7. Explosion and fire of electric pump station

The subproject pump stations are powered by electrics, therefore during the operation, the risk of short-circuit failure resulting in damage to the works may happen. If the problem occurs, it will affect the irrigation water supply for production. However, this risk is very rare but the Subproject Owner should conduct annual, periodically monitoring and maintenance to minimize the impact of incidents.

3.3. POTENTIAL NEGATIVE IMPACTS AND RISKS OF NON-STRUCTURAL WORKS

3.3.1. Waste generation

3.3.1.1. Waste from aquaculture

A rather important orientation of the subproject is the development of the livelihood model when the traditional 2-rice production is shifted to 2-rice (applied integrated pest management) combined with 1 aquaculture crop or another cash crop to improve livelihoods in flood season, resulting in higher economic efficiency.

Depending on each aquaculture activity, there will be different impacts on the environment and many aquaculture activities will improve the environment as follow:

- Model 1: 2 rice crops + 1 natural fish crop: growing 2 rice crops of winter-spring and summer-autumn from November to August which meet VietGap standard, towards environmentally friendly and traceable organic production. Fish are raised naturally in compartments in flood seasons from August to November and harvested when flood season ends. Fish are kept in net-pens to prevent losses. Then floodwater from the compartments will be drained for starting a new crop.
- Model 2: 2 rice crops + 1 giant freshwater shrimp crop: growing 2 rice crops of winter-spring and summer-autumn from November to August which meet VietGap standard, towards environmentally friendly and traceable organic production. Giant freshwater shrimps will have been nursed in small ponds of households (account for 20-30% of the total production area of each household) since summer-autumn rice crop. After harvesting summer-autumn rice crop, flood water will overflow into the field and this floodwater will also bring nursed shrimp into the field. Shrimps will be kept in net-pens to prevent losses and harvested when flood season ends.
- Model 3: 1 rice crop + 01 cash crop + 01 natural fish crop: growing a winter-spring rice crop from November to March, followed by a cash crop (chilli, corn...), and in August when flood water comes, natural fish will be raised from August to November and then harvested after ending flood season. Fish will be kept in net-pens to prevent losses. After fish are harvested, floodwater will be drained for starting a new crop.
- Model 4: 2 rice crops + 1 duck crop + 01 natural fish crop: this model also grows 2 rice crops of winter-spring and summer-autumn from November to August. During the 2 rice crop production, ducks will be raised to take advantage of duck's eating insect pests in the rice to reduce diseases and ducks can eat scattered rice seeds after harvest to reduce the amount of food for ducks. After flood comes, the field will be full of floodwater and it's the time for raising natural fish in net-pens

- Model 5: 1 rice crop + 1 natural fish crop + 1 aquatic plant crop (lotus, Sesbania sesban, etc.): The model will produce 01 stable winter-spring rice crop from November to March, then plant 1 floating rice crop in combination with naturally raising fish during flood season. Fish are raised like the above models.
- Model 6: 2 rice crops + 1 natural shrimp/fish crop: This model produces 2 rice crops of winter-spring and summer-autumn. In flood season, naturally raising shrimps/fish will be kept in net-pens and harvested when flood season ends.
- Model 7: lotus + natural fish + tourism: This model produces lotus all year round, raises freshwater fish in lotus ponds, and combines with tourism activities from Tram Chim NP nearby. Lotus is an aquatic plant that can treat the environment, its whole body and roots can self-decay and do not generate waste to the environment. The activities that generate waste will be from tourism activities and will be evaluated in the following section.

Among 7 models, 6 models are raising natural fish which do not require feeding (*Figure 3.14*). Fish will eat phytoplankton in floods stored in the compartments; therefore, there have no impacts on the environment. Only the model of 2-rice crop + 1 Giant fresh water shrimp is likely to affect the environment.

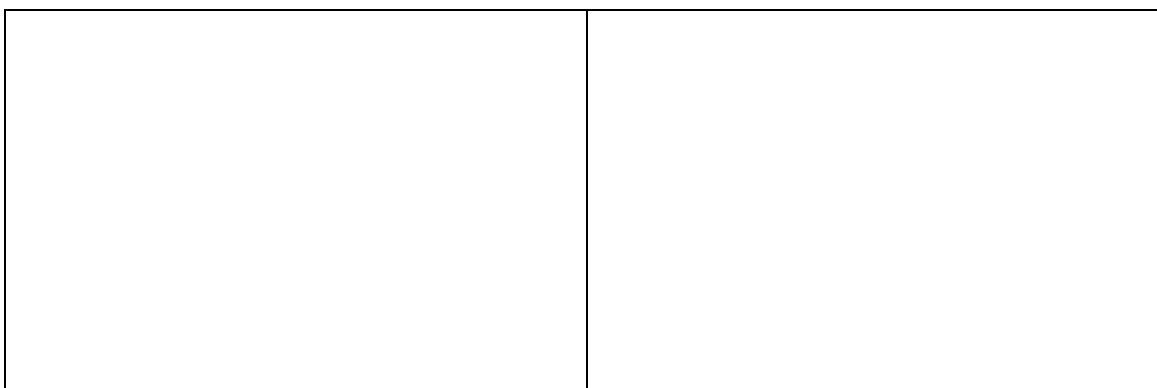


Figure 3.14: Raising shrimp and fish in flood seasons with net-pens

Raising giant river prawn at the density of 1-5 shrimp/m²: This activity remains very extensive (wild feeding, just releasing stockings, no need to feed or feed very little because the density of shrimp is thin and shrimp can feed with phytoplankton, plankton in water). Due to the low density, the shrimp feeding will be mainly from nature. In the last months of a crop, supplementary food will be used to feed shrimps, however, this amount is not many, only accounting for 20-40% of feeding industrial shrimp. Due to the low density, it is not necessary to organize eliminating natural enemies or use of chemicals. Therefore, the impact of this activity on the environment is not much.

In fact, the estimated shrimp production of the subproject model is 1.3-1.5 tons/ha. The aquaculture with low production capacity is also a factor to bring about economic efficiency.

Table 3.30 shows that one shrimp crop (6 months) of 1 ha with a yield of 1.5 tons of shrimps will generate into the environment around 1.68 tons of organic waste (0.16 kg/m²), 66.15 kg N (approximately equivalent to the urea amount used for 0.5ha of rice). With the above calculation of generated waste, it is obvious that the level of impact is not significant and is within a limit that the water environment can be easily self-purification and impacts on the environment are moderate.

It is assumed that the scale of the water surface in the feeding area and the extreme assumption is that all waste is concentrated in the final 2 months of a crop, the amount of organic waste from shrimp culture will be 5.3 grams/m²/day. This is relatively low compared to the self-cleaning capacity of the natural environment (from 5-40g organic matter/m²/day). Thus, with the form of extensive farming as introduced in the subproject, the disperse of pollutants into the environment is considered very small. If the shrimp density is strictly complied, with the scale of 100 ha during the subproject implementation and expected to replicate to 1,000ha in the area of about 10,000 ha, the impact of shrimp culture on the environment remains small and the substances discharged from the shrimp culture are within the self-purification of the natural environment.

Table 3.30: Emissions from 1 ha of shrimp with yields of 1.5 tons/ha

No.	Item	Calculation method	Quantity (T)
1	Shrimp yield (ton/ha)		1.5
2	Feeding stuff	FCR (Feed Conversion Ratio) =1,4	2.1
3	Waste generated (mainly organic waste)	Amount of feeding stuff*80% (Shrimps uptake 20%, waste 80%)	1.68
4	Nitrogen containing waste (feeding stuff with 6%N =39% raw protein)	Amount of feeding stuff*5%*63% (Shrimp uptake 37% N, waste 63%)	0.06615
5	Phosphorous containing waste (feeds with 1,2%P content)	Amount of feeding stuff *1,2%* 55% (Shrimp uptake 45% P, waste 55 %)	0.01134

Assuming the shrimp farmer will want to cultivate intensively at a greater density with higher production yields, expectedly the 4 ton/ha/crop develops the risk of a high waste discharge

Table 3.31.

Table 3.31: Emissions from 1 ha of shrimp with yields of 4 T/ha

No.	Item	Calculation method	Quantity (T)
1	Shrimp yield (ton/ha)		4
2	Feeding stuff	FCR (Feed Conversion Ratio) =1,4	5.6
3	Waste generated (mainly organic waste)	Amount of feeding stuff*80% (Shrimps uptake 20%, waste 80%)	4.48
4	Nitrogen containing waste (feeding stuff with 6%N =39% raw protein)	Amount of feeding stuff*5%*63% (Shrimp uptake 37% N, waste 63%)	0.1764
5	Phosphorous containing waste (feeds with 1,2%P content)	Amount of feeding stuff *1,2%* 55% (Shrimp uptake 45% P, waste 55 %)	0.03024

Table 3.31 shows that if the industrial shrimp culture is conducted with a modest yield of 4 T/ha, the waste from one hectare of shrimp culture will be very large, including 4.4tons of organic waste (0.44 kg/m²), 176.4kg Nitrogen (corresponding to the production of 1.5 ha of rice). This is a factor that needs to be considered in order to direct people to apply suitable production models.

Solid waste feed stuff packages

Packaging waste from feeding and treatment of aquatic animals... The composition of food packages is mainly nylon, silk yarn, and organic matters – the main component of food attached to packages. The composition of antibiotic packages contains chemicals and antibiotics. According to the survey data from aquaculture households with the 2ha model, this waste amounts about 1kg/day.

Although the volume of waste generated from each model is small, it is a pilot model for replication in the region. Therefore, the subproject owner should have training programs on how to efficiently and environmentally manage this waste.

Impact of disease and antibiotic use from aquaculture

Most aquaculture processes are natural and populated but we cannot control all farming households. Increasing the aquatic density or using antibiotics or over feeding can cause water pollution.

In addition, poor farming techniques can cause disease, which affects the quality of water and spread the disease rapidly to surrounding and downstream areas.

3.3.1.2. Waste from rice cultivation

In term of rice intensive farming, farmers need to use a certain amount of fertilizer and pesticides to protect their crops. Both actions cause environmental impacts including excess fertilizer in agricultural production is a source of nutrient eutrophication; pesticides pollute the environment as well as become residues in products that affect the quality of products.

Basically, rice is still the priority option in the subproject. In 7 models, 6 models are engaged in rice production: 1 model of retaining W/S crop, 4 models of retaining S/A crop, 1 model for floating rice cultivation, while there is only 01 model for planting cash crops and 01 model of lotus planting. However, the rice cultivation here to be applied the IPM, which aims to produce organic rice with its environment and traceability. Basically, the rice production by these models will not differ from the current rice production. However, when applying the IPM, it will reduce the use of fertilizer and pesticides and thus reduce the impact of rice production on the environment compared to the current ones. At the same time, it contributes to the maintenance and rehabilitation of natural aquatic species in flood seasons in the growth and development environment.

Agricultural and fishery extension is one of the key tasks of the Subproject. It is expected to organize training on the IPM and “one must five reductions” for local farmers. This is a precondition for the development of the production models that reduce costs, fertilizers and pesticides bring economic benefits to people as well as reduce waste to the environment.

Experience from the “one must five reductions” model in Gao Giong commune, Cao Lanh district, Dong Thap province implemented by the Agricultural Extension Center in collaboration with Thuan Tien Agricultural Service Cooperative in September 2017 within the framework of VnSAT Project shows that when applying the “one must five reductions” model, 1 ha of paddy field reduced 60 kg of rice seed, 35 kg of fertilizer (decreased 25 kg of nitrogen, 30 kg of phosphate but increased 20 kg of potassium), increased one time of herbicides but reduced 2 times of pesticides, and the farmer’s profit increased by 1.3 million VND/ha/crop compared to the normal cultivation practice.

Thus, good application of the “one must five reductions” model, profit from rice production in the subproject area is 11.3 billion VND/crop. This also reduces 218.2 tons of nitrogen, 261.8

tons of DAP (47 tons of nitrogen and 126 tons of P_2O_5), but increases 174.5 tons of potassium fertilizer to the environment. In summary, the “one must five reductions” model will reduce the use of 305.4 tons of fertilizers of all types, therefore, reduces the loading of waste into the environment in the subproject area and the adjacent areas (*Table 3.33*).

For plant protection pesticides, each type has a specific dose. For example, aphid pesticide powder is usually used with 30 to 150 g/ha/time or aphid pesticide emulsion is used with 0.25 to 2L/ha/time. However, if only calculating for the use of aphid pesticide powder of 50g/ha on average, after one year in the subproject area farmers can reduce a total of 0.44 tons of pesticide (decrease 0.87 tons of pesticide, aphicide and increase 0.44 tons of herbicides).

Therefore, the application of the “one must five reductions” model brings benefits and economic efficiency (increase profits) while reduces the use of pesticides and ensures the environment.

Table 3.32: The results of the application “one must five reductions” for W/S crop in 2018 in Gao Giong commune, Cao Lanh district, Dong Thap province

No.	Item	Unit	Cultivation with One must five reductions		Normal cultivation		Difference
			Quan tity	Total	Quan tity	Total	
1	Cost of materials			6,812,500		8,707,000	-1,894,500
1.1	Rice seeds	kg	100	1,300,000	160	2,080,000	-780,000
1.2	Fertilizer		315	2,860,000	350	3,235,000	-375,000
	Urea	kg	125	800,000	150	960,000	
	DAP	kg	120	1,500,000	150	1,875,000	
	Potassium	kg	70	560,000	50	400,000	
1.3	Pesticides			2,652,500		3,392,000	-739,500
	Weeds	time	2	547,500	1	220,000	
	Snails	time	1	280,000	1	270,000	
	Aphids	time			2	1,185,000	
	Others	time	3	1,825,000	3	1,717,000	
2	Labor costs	time		7,419,000		6,818,000	601,000
3	Other costs	ha	1.0	332,000		361,000	
4	Total cost			14,563,500		15,886,000	-1,322,500
5	Yield (fresh)	kg	6,500		6,500		0
6	Total revenue	VND		37,700,000		37,700,000	-
7	Profit	VND		23,136,500		21,814,000	1,322,500
8	Profitability ratio			1.59		1.37	0.22

Source: Dong Thap DARD, 2018

Table 3.33: Estimated profit from production activities “one must five reductions” for the subproject

No.	Item	Unit	One must five reductions	Normal cultivation	Difference for 1 ha	Difference for the subproject (8,727ha of rice cultivation)
1	Rice seeds	kg	100	160	60	523,620
2	Fertilizer		315	350	35	305,445
	Urea	kg	125	150	25	218,175
	DAP (18% nitrogen, 46% phosphate)	kg	120	150	30	261,810
	Potassium	kg	70	50	-20	-174,540
3	Pesticides					8,727
	Weeds	time	2	1	-1	-8,727
	Snails	time	1	1	-	-
	Aphids	time		2	2	17,454
	Others	time	3	3	-	-
4	Profit	Mil. VND			1.3	11,345

3.3.1.3. Wastes from tourism activities

The development of tourism is associated with the model No.7: lotus – cultured fish – tourism. Because the model is located next to Tram Chim NP, it is successful only when being combined with the number of visitors from the Park. However, when this activity develops, a large number of domestic wastes will be discharged into the environment.

According to the data from the Management Board of Tram Chim NP, the number of visitors to Tram Chim in 2016 was 83,000 turns, an average of 227 visitors per day. However, visitors, in fact, concentrate on weekends (Saturdays and Sundays) and holidays. Thus, the highest number of visitors can be up to 728 turns per day.

At the location of the model, the time for rest, sightseeing, taking pictures, eating takes as maximum as 2 hours. On average, one person per day can emit 0.3 kg of solid waste. Thus, the amount of solid waste generated at the model site for 2 hours will be about 0.07 kg/person. Accordingly, the maximum amount of waste generated at the model site is about 51kg. At the destinations, there are waste collection systems, trashes and signboards; therefore, the waste is collected so as not to be released into the environment.

At the same time, there are septic toilets at the destinations, therefore all waste water will be collected and treated.

So the impact on the environment is average and appropriate mitigation measures will be applied as given in *Chapter 4*.

3.3.2. Impact from expansion of livelihood models

The large-scale development of a group of products while not having access to market for the outputs can lead to bank debt, poverty and landlessness.

Conflicts of water use may arise if the embankment for each production model is not properly completed. Among all models, the model of W/S rice – floating rice – natural fish in Binh Thanh commune- Hong Ngu town requires flood water into fields at the beginning of flood season from June to November, which is different from the existing production (usually taking flood water in August), therefore, the transformation should be carried out synchronously in each compartment to avoid conflict in water use. However, this conflict is low because when being developed on the large scale, the model is planned in detail and planned for appropriate exploitation and use of water resources, not to let develop spontaneously.

Using upstream water for aquaculture possibly affects downstream water quality and downstream water use. In the absence of floods, it is possible to affect downstream water.

3.3.3. Impact of water quality on aquaculture models

The results of upstream water monitoring show that this is upstream area but the water quality is average due to the impact of commercial catfish culture, mainly in Hong Ngu town and Tam Nong district, along the main canals as Vinh Hung – Hong Ngu canal and other canals. It affects aquaculture activities due to high TSS, high organic pollutants and low DO. It may cause adverse effect to fish, shrimp and livestock. Therefore, it is necessary to prepare supportive measures like supplemental aeration, mesh net, etc. to respond when the situation occurs.

The use of plant protection chemicals and fertilizers of previous crops in the subproject area or the use of plant protection chemicals and fertilizers in adjacent areas may affect the water quality significantly and hence affect aquaculture products. This is a very important point to be noted when deploying the Subproject on a large scale.

3.3.4. Social issues in flood related adaptation models

3.3.4.1. Impacts on ethnicity

As mentioned above, Dong Thap has a very small population of ethnic minorities in the subproject area. The ethnic Khmer, Cham and Hoa have largely inter-married with Kinh and are largely integrated into the wider land holding Kinh communities. There are no segregated ethnic communities or villages in the area. So the impact on ethnicity is negligible.

3.3.4.2. Impacts on cultural heritage

There were no concerns over the loss of cultural heritage in Dong Thap as a result of the proposed livelihood changes. In double rice cropping areas, ancestral graves have never been built on flooded land or if they have, they are built on raised platforms to keep them above flood water.

In long established triple cropping areas, ancestral graves are present within the high dykes. However, since these areas are presently not being targeted by the project, there is no issue at present regarding the need to compensate for their relocation. If the project at a later stage implements flood-based livelihoods that replace the third rice crop, the relocation of graves will be an issue.

No other types of cultural heritage like places of worship or cultural practices were identified as being of concern.

3.3.4.3. Impacts on employment

The addition of flood season aquaculture in the subproject area to 2-rice crop livelihoods will result in marginal increases in labor demand as there will be an additional flood season crop where there was none previously. However, labor demand (eg. installing, maintaining and monitoring nets, harvesting, transportation) will be marginal because of the extensive nature of the aquaculture. This marginal increase will also be needed to offset the potential loss of fishing grounds for the poor. During the flood season, the flooded fields are considered open access areas for fishing. The erection of aquaculture nets for shrimp and fish around the bunds of farms will reduce the amount of open access area that can be exploited by the poor.

3.3.4.4. Impacts on poverty and landlessness

In general, there is a close link between poverty and landlessness in the area. Most of the poor focus group participants indicated that they were either landless or land poor. To survive, the landless participants work as paid laborers on fish and shrimp farms, rice farms, tending cash crops, or work in services such as small-holder trading or transporting goods by motorbike. The declining wild capture fishery is no longer an attractive proposition for many poor.

Reasons of poverty in the subproject area that were cited by focus group participants include the lack of productive land, lack of employment opportunities, lack of job skills, having too many children, lack of capital/access to funds and local credit.

Because the subproject aims to support and facilitate land-use change, the direct beneficiaries of the subproject are land holders. Agricultural mechanization, particularly in rice, and declining capture fisheries has already hit the poor hard. The subproject will result in negative impacts on employment opportunities for the poor and likely increase inequality unless the subproject pro-actively provides opportunities for the poor. However, during the implementation of livelihood models, the local authorities will encourage agribusiness (particularly vertically integrated companies) companies to extend their value chains to create employment opportunities for the poor.

3.3.5. Risks related to development of livelihood models

3.3.5.1. Risk of market

At present, it is lack of a clear and stable market for the products of the models. The transformation of agricultural structure do not have adequate research on market, consumer demand, agricultural development planning trend, etc. Therefore, the mass transition to the new economic model likely lead to production failure when there is no demand for output and stable price market.

No flood is the risk that affect the culture of giant river prawn and the development of floating rice if there is no solution to regulate water.

3.3.5.2. Abnormal weather conditions affect the models

At present, a series of reservoirs and dams have been built in the upstream of the Mekong River, leading to the problem of the downstream water regulation. Especially in recent years,

the water level in the Mekong River is decreasing in flood seasons combined with abnormal weather which lead to no floods and there may not be enough water for the aquaculture models.

In contrast, big floods may destroy the aquaculture nets that cause loss of aquatic resources.

3.3.5.3. Risk of disease

In shrimp aquaculture, epidemics are the most unavoidable factor. This is a high-risk factor for farmers. In many areas farmers loss all crops and can not restore and abandon farming. In case the risk of damage is usually very large and there must be mechanism and policies to support farmers to restore their production.

3.3.5.4. Resistance from farmers

Proposed livelihood models are existing models in the area, in accordance with the natural conditions of each districts, with community consultation during the proposal process. Moreover, during the implementation of the livelihood models, the subproject owner will conduct technical training, brand development, support in finding markets so the people's resistance is very small.

3.4. OTHER IMPACTS OF THE SUBPROJECT

3.4.1. Induced impacts

3.4.1.1. Induced impacts of structural works

Land use change at disposal sites: As metioned above 10.5/15 ha of land for disposal sites is earth pond (surface water) which are formed building of the residential clusters over the flood in 2000. As it is formed from the soil exploitation of for the construction of residential clusters, these ponds areas are quite deep (from 8 to 15m) so they have not been used for agricultural production for a long time. After filling up by dredged sludge, the ponds can be used for agriculture production, so the induced impact is low.

More sustained fresh water supply will be provided for livelihood models leading to more use of pesticides. Pesticides are toxic chemicals designed to be deliberately released into the environment. Although each pesticide is meant to kill a certain pest, its excessive use will lead to contamination the air, soil and water when they run off from fields, escape storage tanks, are not discarded properly and especially when they are sprayed aially.

3.4.1.2. Induced impacts of non-structural works

Given that aquaculture farming could bring more benefits to farmers, it is likely that expansion of the aquaculture activities and/or the proposed models could occur quickly without inadequate management and/or control. From the environmental and social perspectives, implementation of these models may trigger induced impacts which include (i) changes in land use from rice cultivation to aquaculture; (ii) disease spread; (iii) degradation of natural habitats, and (iv) increasing water pollution. These, in turn, would negatively affect biodiversity, water supply, and income of the poor who may not afford aquaculture farming. These induced impacts should be addressed comprehensively at the provincial and local levels.

Currently, land use in this region is mainly 2 and 3 rice crops production. The activities of a subproject are to change some of the production activities in order to improve and increase the

income of the local people. This activity will change the land use purpose in the region; however, this is the process which requires time. Based on the result of some livelihood models which have been piloted in the subproject, the subproject owner will step by step prepare the schedule planning and time to change the land utilization to be suitable, avoid the case that local people will self-study and self-develop not following the plan, avoid the conflict during the operation and utilization of the land which is not suitable with the natural features and utilization condition of the water resource.

There is a risk of mass production posing a threat of disease spread on a wide scale especially in the expansion of aquaculture farming areas. In production, concentration development poses a risk of infectious diseases to the aquatic species due to a variety of breeds or due to cross-infection of a disease from one farm to the others. The quenching of an epidemic in a large farm is also difficult because it is unable to find and kill the pathogen simultaneously in a large area. Therefore, sometimes the disease is stopped affecting in one place but is still inactive at another place, therefore, this source of disease continues to spread out to the environment. This is the popular pattern among the shrimp farming areas. The shrimp farming is not constant throughout the year as there are 4-5 months off in the dry season but there is still a risk of spreading disease to the area from an affected fish pond/ shrimp farming compartment.

Animals such as birds may be poisoned by pesticide residues that remain on food after spraying. An application of pesticides in an area can eliminate food sources that certain types of animals need, causing the animals to relocate, change their diet, or starve. Fish and other aquatic biota may be harmed by pesticide-contaminated water. Application of herbicides to bodies of water can cause plants to die, diminishing the water's oxygen and suffocating the fish.

Community health and safety issues during the production of annual crops may include the following: i) Potential exposure to pesticides caused by spray drift, improper disposal and use of packaging and containers, and the presence of pesticides in potentially harmful concentrations in postharvest products; ii) Potential exposure to pathogens and obnoxious odors associated with the use of manure; and iii) Potential exposure to air emissions from open burning of crop waste.

Pesticides should be managed to avoid their migration into off-site land or water environments by establishing their use as part of an Integrated Pest Management (IPM) strategy and as documented in a Pesticide Management Plan (PMP).

When developing the aquaculture area outside of the planned area will cause the conflict in water resource utilization and the infrastructure.

Regarding the raising scale not following the plan, the local resident people develop the industrial raising which may lead to the risk of environmental pollution, not only degrade the raising environment but also having impacts on the raising activities in the same region.

3.4.2. Cumulative impacts

It can be seen that aquaculture brings benefits to farmers. As a result, there will be an unplanned increase in the farming area. In the consideration of the environmental and social viewpoint, the implementation of these models may have implications for: (i) conversion from the use of rice land into aquaculture land; (ii) spread of diseases; (iii) risk of degradation of natural habitats, and (iv) increase of water pollution.

Massive production results in the risk of disease outbreaks, especially for expanded aquaculture areas. In production, the focal raising increases the risk of infected diseases due to

multiple sources of varieties or because when a breeding farm is affected with a disease, it may become an infected source to the surrounding. The elimination of diseases in large farms is also difficult as it is not possible to destroy the disease at the same time on a large scale. When a disease is extinguished at this point, others are carrying germs and are spreading sources of diseases to the environment. This natural law is quite common in brackish shrimp culture areas. Although Giant river prawn farming in the region is not bred year round (4-5 months in the dry season, people do not culture Giant river prawn), however, the risk that one area is affected with a disease, the whole region to be affected is still present.

Conflicts on water-use need to be managed. The difference in water use among winter-spring rice, summer rice, natural fish raising and other production models results in the need for the works that divide these production areas to avoid embankment break when floods overflow water from floating-rice fields to summer rice fields and to other crop areas. In addition, conflicts of water-use occur not only in the subproject area but also between the subproject area and the downstream area.

3.4.3. Regional impacts

The REA analysed the regional impacts of the subprojects under Components 2, 3, and 4 of the MD-ICRSL project are summarized in *Table 3.34*. Most of the regional impacts are positive, and the REA suggests that the negative regional impacts can be mitigated at the subproject level by the implementation of the ESMP. It is noted that although the potential negative impacts of works (dredging canals, strengthening semi-embankment, lining spillways and building sluices and pump stations) to be conducted under this subproject is in line with the key findings of the REA for the MDICRSL that it will generally increase the level of air, noise, vibration, and water pollution as well as increasing local traffic congestion including road safety risks and disturbance to local residents and they could be mitigated by (a) ensuring that contractors apply good construction practices and initiate/maintain close consultation with local authorities and communities throughout the construction period and (b) close supervision of field engineers and/or environmental officer as recommended in the REA.

The regional negative impacts of the subproject activities during operation of the dykes and culverts and application of the livelihood models can be mitigated through technical assistance to be provided during the preparation and implementation of the livelihood development models. The technical assistance will also address the need for extensive consultation with water users and key stakeholders during the development of sluice operations and possible impacts due to the expansion of aquaculture farming the livelihood model without adequate management and control. In addition, the water resources monitoring program and MARD real-time operations system for hydraulic infrastructure under Component 1 of the MD-ICRSL project will inform information for the management of these regional impacts (*Table 3.34*).

Table 3.34: Summary of regional impacts for Components 2, 3 & 4 of the MDICRSL Project

Activity	Demand on natural resources	Significant impacts	Impact
		Intensity/Extent/Duration	Rating
Installing water/flood control structures in the upper delta	Increased flood retention in the project area. Changes in hydrological flow and land	• Surface water quality issues from conversion to aquaculture and freshwater shrimp <i>M/Sr/Mt</i>	Moderate
		• Increased flood retention in the upper Delta <i>H/R/Mt</i>	Moderate
		• Increased nutrients and sediments during flood season <i>M/Lo/Mt</i>	Moderate

	use.	• Reduced flood risk to downstream provinces <i>H/R/MT</i>	Moderate
		• Protection of high value agriculture (fruit trees) <i>M/Lo/Mt</i>	Moderate
		• Conflict over water use <i>M/Lo/St</i>	Moderate
		• Improved ecosystem connectivity from changes in hydrological flow <i>M/Sr/Mt</i>	Moderate
New livelihood models in the upper delta	Pilot areas of land (ha) for alternative farming.	• Increased income from converting from triple rice to rice + aquaculture <i>M/Lo/Mt</i>	Moderate
		• Increased surface water pollution from freshwater shrimp and aquaculture <i>M/Sr/Mt</i>	Moderate
		• Increased fertiliser and pesticide use for new vegetable crops <i>M/Sr/St</i>	Moderate
Expanding aquaculture and shrimp farming	Conversion of land for sustainable shrimp farming.	• Reduced income for intensive shrimp farmers <i>M/Lo/St</i>	Moderate
		• Conflict between fresh and brackish water uses <i>M/Lo/St</i>	Minor
		• Improved surface water quality from reduced intensive shrimp <i>M/Sr/Lt</i>	Moderate
		• Reduced use of groundwater <i>M/Sr/Mt</i>	Moderate

Note:

- **Impact intensity** is evaluated as high (H), medium (M), or weak (W)
- **Spatial extent** is evaluated as regional (R), sub-regional (Sr), or local (Lo)
- **Duration** is evaluated as long-term (Lt), medium term (Mt), or short term (St)
- **Color codes:** Blue for positive regional impacts; Grey for negative regional impacts

3.4.4. Impacts of climate change on the subproject and vice versa

To forecast the flood drainage capacity, flood storage capacity and adaptability to the climate change of the subproject, the hydraulic-hydrographic regime of the region has been simulated based on MIKE-11 model (Danish Institute of Hydraulics and Environment (DHI)) with the following options: (i) without the subproject construction in the subproject area (existing works) (HT) and (ii) with building the structure works of the subproject as mentioned in Section 1.4.2 (PA1).

Scenarios for calculating as follow:

- Baseline scenario (HT): Calculate to simulate water-flow regime in the average flood year of 2009, in the driest year of 2010, and the typical flood year of 2011, with the terrain and current status updated to 2015 for other regions and updated to 2017 for Dong Thap province.
- Scenario I: Calculate the scenario of sea level rise under MONRE's scenarios, plus impacts of upstream changes (increase in incoming water flow).

3.4.4.1. Forecasting the ability of flood drainage, flood retention

The comparison of the current condition (before construction of structural works of the subproject) with the effectiveness of the subproject after dredging canals, culverts, pumping

stations, dykes and spillways at the canal upstream which have been completed and put into operation shows as follows.

a) *In flood seasons*

- Water levels: After the subproject structure works completion, the water-levels are almost unchanged, as shown in *Figure 3.15*.

In the upper of Coi Tieu canal	In the upper of Khang Chien canal
In the upper of Duong Gao canal	In the upper of Hong Ngu canal

Figure 3.15: Water levels in flood seasons in the area before and after the subproject construction

- Water flows: On the dredged canals after dredging water flows in these canal has increased significantly, which are about 30-50 m³/s in flood seasons. Therefore, the drainage capacity on these canals will increase, conveying more water on the canals. As for the horizontal canals, the water flows have increased insignificantly. Details are in *Figure 3.16* and *Figure 3.17*.

Figure 3.16: Water flows in Khang Chien canal in flood season before and after the subproject construction

Water flow in Hong Ngu canal	Water flow in Dong Tien canal

Figure 3.17: Water flows in horizontal canals in flood season before and after the subproject construction

b) In dry seasons

- The calculation results that in case of the subproject completion, the water levels in the canals are almost unchanged, but on the dredged canals, the conveying capacity of water has improved significantly (see *Figure 3.18*).
- The water flows in the dredged canals have increased significantly, averaging 5-15 m³/s of increasing. In the dry season, with more water to be conveyed, there will be an improvement in many aspects of the water needs of people. On the horizontal canals, the water flows are almost unchanged. Please see *Figure 3.19* and *Figure 3.20* for details.

In upper of Suon 2 canal	In upper of Hong Ngu – Tam Nong border canal

Figure 3.18: Water flows in some infield canals in dry season before and after the construction of subproject works

Figure 3.19: Water flows in Khang Chien canal in dry season before and after the construction of subproject works

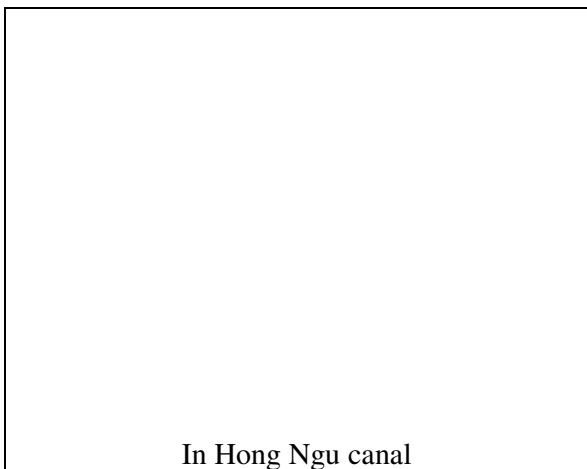
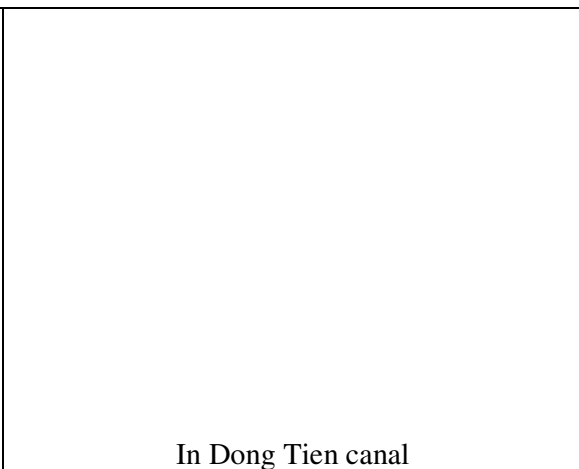
 <p>In Hong Ngu canal</p>	 <p>In Dong Tien canal</p>
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Figure 3.20. Water flows in horizontal canals in dry season before and after the construction of subproject works

Therefore, it can be seen that the investment in the construction of the subproject works when they go into operation will not significantly change the water levels on the canal system. However, they will significantly improve the water conveyance capacity on the canals in the subproject region, especially at dredged canals with an increase of 5-15 m³/s in dry seasons and 30-50 m³/s in flood seasons. This will improve the capacity of flood drainage. The additional water supply will improve the water demand of the people in many aspects as well as increase the ability of water exchange and circulation to improve the environment in the area.

At the same time, increasing water flows on the canals while the water levels remain almost unchanged will increase the amount of water stored on the canal system. In addition, the annual flood-water source will be retained in the fields, covered by August embankments and culverts and pumping stations for the development of flood-season livelihoods. Accordingly, flood water-levels will be kept in the fields at 1.5-2.0m compared to the natural ground after floods run dry and keep water until the end of flood season. In the case of low floods, the pumping system will be used to supply water from the canals into the fields to adapt to the stable water levels for flood season livelihoods. Under the current conditions, in low flood

years, the water levels in the fields are only at 0.5-1.0m. In many areas with high terrain like Hong Ngu district and Hong Ngu town, flood-water drains quickly within 10-15 days, making it difficult to keep flood-water. Therefore, when the works of the subproject are in completion, they will intensify the capacity of flood storage for the subproject region.

3.4.4.2. Assessing impacts of the subproject to climate change and sea level rise

a) In flood seasons

On the axial canals, the water flows and water levels in case of with the subproject are more different than in the case of without the subproject. However, on some dredged axial canals, like Khang Chien canal, the flows of flood conveyance in the climate change condition is significantly increased, about 70 m³/s compared to the case of not dredging and about 40m³/s in the case of current status. See details in *Figure 3.21* and *Figure 3.22*.

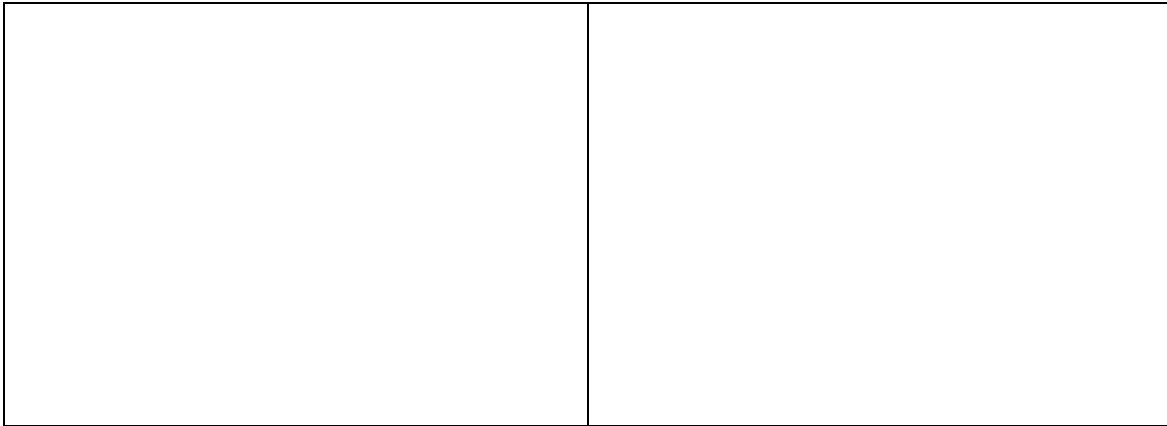


Figure 3.21: Water flows and water levels in Dong Tien canal in flood seasons

Figure 3.22: Water flows in Khang Chien canal in the flood seasons

b) In dry seasons

In dry seasons, the impact of the subproject construction on water levels is almost negligible. Dredging canals will improve the water conveyance in the canal system, increase water taking, as well as provide water for users. For example, in Khang Chien canal, the average flow increases about 5-6 m³/s compared with the current condition and increases about 10m³/s compared to the non-dredged case (*Figure 3.23*).

Therefore, in the conditions of climate change and sea level rise, in addition to the impacts of upstream development (incoming water-flow is increasing), there will be an increase in annual flood flows. The works of the subproject to be constructed will improve the ability of flood drainage in the region and the adaptation to climate change. At the same time, the increase in temperature due to climate change in the future will affect the aquaculture in the region, especially shrimp farming. When there are the works of the subproject, flood-water will be stored in the August-dykes to serve the livelihood development in flood seasons with the water-level averaging 1.5-2.0m. In case of low flood years, we can use the pumping stations to pump water from canals to the fields to gain the water-level of 1.5-2.0m to serve aquaculture in flood seasons. The stable water-levels will help stabilize the temperature in the water environment, which will help stabilize production thank to temperature increase and climate change adaptation.

Figure 3.23: The largest volume of flood water conveyance on the Khang Chien canal in dry seasons

CHAPTER 4. ASSESSMENT OF SUBPROJECT ALTERNATIVES

This chapter systematically compares feasible alternatives to the proposed subproject site, technology, design, and operation—including the “without subproject” situation—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, quantifies the environmental impacts to the extent possible, and attaches economic values where feasible. States the basis for selecting the particular project design proposed and justifies recommended emission levels and approaches to pollution prevention and mitigation.

4.1. NEED OF THE SUBPROJECT

Floods are the natural process that maintains productivity and promotes dynamic development in the MD. Annual floods supplement important nutrients to the soil of agricultural production. Climate changes may increase floods more clearly. The main challenge is to keep floods naturally and to protect the downstream provinces from over-flooding.

The subproject is implemented in the upstream. It will upgrade existing semi-dike and build culverts to expand flood retention in rainy seasons. The culverts will let annual floods cross the dike, which helps expand agricultural production in the Plain of Reeds and Long Xuyen Quadrangle in Kien Giang, Dong Thap, An Giang provinces. The infrastructure will support the conversion from 03-rice crops to 02-rice crops combined with raising floating plants or aquaculture (freshwater fish or shrimp). The semi-dikes (August dikes) upgraded from soil to concrete will reduce maintenance cost and facilitate transportation. The subproject will protect agricultural values.

The construction of culverts in the subproject area will provide water for agriculture in rainy seasons. Currently, dikes are built to control floods and intensify rice, preventing floods from entering floodplains for 03-rice crop growing area. The culvert operation will control the water level in the subproject area and promote floating vegetables, aquaculture and freshwater shrimp culture. Water-use conflicts may occur among growers of different benefits and the areas of increased flood retention. The positive effect of the increased flood retention is the supplement of sediment and nutrients from the Mekong River, which helps reduce fertilizers and pesticides in agricultural activities. The dikes will help the smart agriculture and sustainable agricultural practices transform into aquaculture.

The Subproject can change the hydrological upstream flow that affects the natural resources and habitats of aquatic species. However, the August dikes will divide the delta and reduce the ability of ecosystem connectivity, leading to a decline in fishery. The flood retardation may increase the biodiversity in the flooded ecosystem.

The development of upstream livelihood models will assist farmers in the transition of three-crop rotation. Providing supportive measures to farmers for their alternatives to rain-fed rice is an important way to switch from 03-crop rice to floating vegetables or freshwater fish and shrimp. The upper three-crop rice gives lower yield while the production cost is higher. Increasing rice production leads to using more pesticides and fertilizers, reducing the cost benefits of A/W crops and increasing surface water pollution. Farmers also found that their paddy fields are less fertile due to the reduction of deposition of silt from high dikes and flood control structures.

The Subproject will support proper livelihoods in flood seasons in the region, including diversification of agricultural and aquaculture production models. This helps the enhancement of value chains and linking farmers to businesses and markets. The shift to high-value agricultural production will provide many positive social benefits to local communities and households involved in livelihood models. In order to ensure sustainability, the Subproject must consult with the community to ensure that farmers change to alternative farming.

The rehabilitation of the prone-flooding area will provide more nutrients and sediment in flood seasons but the impact of increased use of pesticides and fertilizers should be considered. The high-value livelihood models for farmers (fruit trees) may require higher inputs of fertilizers and pesticides. Environmental impacts of farming giant freshwater prawn and freshwater fish are attributable to organic waste, agrochemicals, antibiotics, disease outbreaks and impacts on endemic fish species in the Mekong Delta and the wetlands, which should be considered. In order to minimize environmental impacts, an IPM program will be implemented for the Subproject as part of the ESMP. Monitoring the surface water quality will need to be implemented in the subproject area.

4.2. ANALYZING “WITH” AND “WITHOUT” THE SUBPROJECT

This section aims at analyzing environmental and social impacts in the “with” and “without” subproject alternatives (*Table 4.1*):

- In the case of “without” subproject: There are no investment in the construction of infrastructure as well as no solutions to support the production activities of local people, therefore the production activities take place as usual.
- In case of “with” subproject: the subproject will implement 02 components: Structural component (dredging canals, strengthening semi-embankments, lining spillways, construction sluices and pump stations), non-structural component (development of livelihood models; investment in technology and non-construction solutions).

Table 4.1: Analysis for “with” and “without” the subproject

Impacts	Without	With
Impact on socio-economy		
Land clearance due to land acquisition	There is not land clearance due to land acquisition	Acquisition 20ha of land for construction of works
Infrastructure	<ul style="list-style-type: none"> - The culvert system does not meet the requirement for flood control in August. The pipe culverts are mainly temporary without open/close systems or if there are open/close systems, the operation encounter difficulties. - The embankment system is not high enough (mostly at the elevation of +2.5m, the surface is small at about 2.0m wide). Many sections are broken, eroded which require reinforcement every year. At present, there is not soil-filling for many important sections. - The main canal system is rapidly deposited, resulting in a lack of water for agricultural production. - Regarding the waterway and road transport system: it is unable to combine the current dikes for rural traffic due to annual flooding, erosion and landslides. The main canal system runs dry, which seriously affects the transportation of machinery and materials for production and agricultural products by waterways, especially in dry seasons. 	Embankment and spillways are hardened. Culverts and pump stations are built solidly. Canals are dredged to facilitate the water flow to ensure the regulation of water sources for production.
Stabilization of production	Unstable production because the dikes may be broken at the beginning of flood seasons and temporary culverts cannot regulate the water source.	Being more active in production as the dike system has been solidified, the affection of early flood is almost eliminated and by the end of the flood season, we can take time to bring water to

Impacts	Without	With
		produce winter crops to contribute to limiting impact of the early next year flood.
Economic loss	Every year, local people and local authorities must maintain the embankment for production.	The dike embankment to be solidified will not cost for maintenance.
Loss caused by flood	The dike embankment has not been solidified, therefore sometimes the embankment may be broken causing damage to production and rehabilitation cost.	It is almost impossible to be broken at early flood seasons.
Development of livelihood models	People mainly cultivate rice, which has a low yield.	Develop ecological models; eliminate rice monoculture; switch to the production modes which are suitable to the water conditions (shrimp, rice, fish in natural flood season); plant vegetables (meeting the market demand); grow lotus; develop tourism; diversify production objects to contribute to stable production and income increase. People change to new production methods which are suitable for flood conditions. They can live with floods and benefit from floods to develop production.
Settling jobs in flood seasons	People do not have jobs or have to work for other areas	People's applying livelihood models in flood seasons not only create income but creates jobs and contributes to stabilizing society.
Enhance product values in the region	The products do not have stable output markets	Products in the region are marketed and brands are developed to increase values and profits for farmers.
Impact on the environment		
Impact on the ability of flood drainage	There is not an impact on the drainage of the main crops.	There is no impact on the drainage of the main crops.
Impact on the environment	The production activities are not skillful; therefore, people use more fertilizers and pesticides than the actual demand. Due to lack of production techniques, despite excess fertilizers, the yield is not high and somewhere increases drug resistance pests.	IPM program; "one must, 5 reduce" program is widely implemented throughout the subproject area, contributing to the reduction of fertilizer and reducing the amount of pesticides to be used.

4.3. CONSIDERED TECHNICAL OPTIONS

Position, techniques in the subproject components are well studied before giving the selection of options. In which the techniques for strengthening embankments is considered between two alternatives: concreting the talus by (i) traditional technology and (ii) Neoweb technology. From there, make an optimum choice for the subproject techniques (*Table*).

Table 4.2: Analysing the considered technical options

Elements	Option 1: Using concrete M250 for the top of dike and side slope with traditional materials.	Option 2: Using concrete M250 for the top of dike and side slope with NEOWEB.
Featured	Using traditional concrete.	NEOWEB is a cellular confinement system, manufactured from a HDPE alloy, it improved for concrete by structuring likely net. It could improve the quality of side slope protections and can be applied for the flood area.
About the material and structure	The body is covered with soil compacted $K = 0.85$, the surface covered with stone and reinforced top of the dike with concrete M250 and 12 cm thick, reinforced both side slopes of the dike with concrete in 8 cm thick.	Side slope protections: NEOWEB and concrete. Side slop protection material: plastic layer; Neoweb 660-75 with grid cell 42x50cm, thick 7.5cm; Concrete ciment M250 thick 7.5cm.
Structure		
Technical requirements	<ul style="list-style-type: none"> - It is difficult to control construction quality during implementing dike. - It is difficult to control the thick concrete layer - The steel couldleak by acid water 	<ul style="list-style-type: none"> - Good application both for manufacturing and implementing - The thick of neoweb is fixed that make easy to control the thick concrete layer. - NEOWEB is made by material that resistant to oxidation, salt water resistance, and it is applied in many countries on over the world.
Cost	195,682 VND/m ²	190,066 VND/m ² , reduction of 3%

Elements	Option 1: Using concrete M250 for the top of dike and side slope with traditional materials.	Option 2: Using concrete M250 for the top of dike and side slope with NEOWEB.
estimation		compare to normal method
Construction	Building time is longer, require formworks;	- It is simple to construction and faster time of construction. - Neoweb could give a higher capacity of concrete mass as well as manageable by manufactory according to ISO.
Conclusion	Non-selected	<u>Selected option</u>

CHAPTER 5. PREVENTION AND MITIGATION MEASURES

This chapter covers mitigation measures to address impacts which highlighted and assessed in Chapter 5. While commonly-known social and environmental impacts and risks of construction activities can be addressed through Environmental Codes of Practices (ECOP), specific mitigation measures should also be proposed to addressed sub-project specific impacts predicted based on site-specific conditions and typology of investments. Some measures can be proposed for incorporation into engineering design to address potential impacts/risks and/or bring about added values of the works provided.

5.1. MEASURES FOR INTEGRATING INTO THE DETAILED DESIGN

In order to promote environmentally friendly development and the ability to adapt to climate change as well as to ensure the achievement of subproject objectives, a number of measures have been integrated into the FS preparation and detailed design of the subproject:

- Decrease land acquired for the subproject (see detail in Section 5.2.1).
- Relevant livelihood models are produced in the direction of organic, VietGap standards, biosafety... have traceability and brand names.
- Using sustainable materials for strengthening embankments, the Neoweb technology will be applied instead of the traditional reinforced concrete technology. This is a grid-shaped system, which is perforated and sanded to improve structural stability. This solution will make the construction simpler and reduce construction time. Neoweb material is durable,

applies permanently to works and easy to control due to materials produced in the factory in controlling quality according to ISO standards. The choice of sustainable building materials will be important in ensuring that the subproject is sustainable in the context of climate and natural conditions.

- Safety signs during the construction and operation of the subproject have been considered and included in the detailed design process of the subproject.

5.2. MITIGATION MEASURES FOR NEGATIVE IMPACTS OF STRUCTURAL WORKS

5.2.1. Mitigation measures for negative impacts during the preconstruction phase

As discussed in Chapter 3, the key site-specific impacts for the subproject during preconstruction phase are impacts on households whose land is acquired permanently and temporarily; impacts from landmines and explosives which still persist in the ground; and (iii) construction site clearance. To prevent and/or mitigate these impacts, the subproject owner will perform the following tasks:

5.2.1.1. Proposed measures for land acquisition

Minimize impacts due to land acquisition for the subproject:

- To carry out the dredging of 37,244km of canals, 7 disposal sites and 4 embankment routes are needed to contain sludge with a total area of 21.66ha. However, during the preparation of the FS and the detailed design, efforts have been made to minimize acquired land by using public land (6.66 ha) and 10.5ha of earth ponds. These ponds are used to exploit soil for building residential clusters to protect people from the flood in 2000, so the area of land acquisition is reduced considerably (*Table 5.1*).
- The locations of the culverts/pumping stations are mainly built on the embankments, field canals. As a result, the acquired area is reducing significantly
- The strengthening of embankments only implements in the existing ones where the elevation is lower than the water level in early floods (August floods) and narrow widths, the area of land acquisition is reduced. This resulted in a significant reduction in the impact of land acquisition, affecting only 141 houses, mainly temporary housing for production, no relocated households.
- No acquisition of temporary land: As the subproject's construction items are scattered and spread across the subproject area, each work item is quite small, hardened routes are on existing land, culverts and sewers have small aperture so the subproject will take advantage of the vacant land area on the embankment and canal routes to execute the construction items.

Table 5.1: Effort in minimizing land acquisition for disposal sites of the subproject

No	Type of land	Land acquisition for disposal site (m ²)			
		Before implementing efforts to minimize land acquisition		After implementing efforts to minimize land acquisition	
		Private land	Public land	Private land	Public land
1	Rural residential land	0	0	0	0
2	Land for rice field	0	85,000	0	45,000

3	Water surface area (earth ponds)	105,000	50,000	105,000	0
4	Land along the canal bank	66,600	0	66,600	0
	Total	171,600	135,000	171,600	45,000

In addition, the most effective mitigation measure is the implementation of the RAP that has been developed specifically for the subproject. In particular, the compensation and support policy is designed in line with the WB's policy priorities, with compensation and support provided to all AHs before announcing the decision on land acquisition and compensation at replacement cost. Compensation costs are detailed in the RAP of the subproject as follows:

- All those affected regardless of ownership status or socio-economic status will be provided with compensation and support for the loss of property, income and production-business activities at replacement cost and restoration of living standards, income and production capacity to the subproject level.
- Land prices to calculate compensation (compensation, assistance) are determined close to the land use right transfer cost in the market under normal conditions. When there is a difference compared to the actual price of land use right transfer in the market, it must be adjusted accordingly.
- Land will be compensated "land for land", or in cash, according to PAP's choice whenever possible. The choice of land for land must be offered to those losing 20% or more of their productive land. If land is not available PPMU must assure itself, that this is indeed the case. Those losing 20% or more of their land will have to be assisted to restore their livelihood. The same principles apply for the poor and vulnerable people losing 10% or more of their productive landholding.
- PAPs who prefer "land for land" will be provided with land plots with the equivalent productive capacity for lost lands or a combination of land (a standard land plot) in a new residential area nearby for residential land, and cash adjustment for the difference between their lost land and the land plots provided.
- PAPs who prefer "cash for land" will be compensated in cash at the full replacement cost. These PAPs will be assisted in rehabilitating their livelihoods.
- Compensation for AHs and structures at the value of new construction of houses and structures that have technical standards equivalent to the affected houses
- To disseminate broadly about the economic development and compensation policies of the government to local communities. Disseminate about the subproject implementation in accordance with rights and duties and laws. Disclose compensation rates (details of each affected asset) to the affected people. Disclose and inform accurately the compensation amount of each household.
- To support vocational training for members of the severely affected households due to land acquisition for the project.

To manage the potential impacts related to land acquisition and site clearance, the subproject Resettlement Action Plan (RAP) has prepared with a budget of **43,439,000,000 VND** to support households who are affected by land acquisition. Of which the support cost is the biggest (24,419,030,000VND) – accounting for 56.2% of the total compensation cost (*Table 5.2*). Compensation costs are based on a survey of market land prices and consultation with affected people.

Table 5.2: Costs for the subproject RAP implementation

No.	Items	Unit	Area	Unit price (VND)	Amount (VND)
A	Compensation and assistance				36,055,597,280
A.1	Land compensation				6,535,750,000
A.1.1	Residential land	m ²	5,989	300,000	1,796,700,000
A.1.2	Paddy field land	m ²	94,781	50,000	4,739,050,000
A.2	House compensation				3,121,457,280
A.2.1	Permanent houses (1 house with area of 40m ²)	m ²	40	2,901,920	116,076,800
A.2.2	Semi-solid houses (23 houses with average area of 40m ² /house)	m ²	920	1,100,000	1,012,000,000
A.2.3	Temporary house (117 houses with average area of 40m ² /house)	m ²	4680	425,936	1,993,380,480
A.3	Crops, trees compensation				1,979,360,000
A.3.1	Fruit trees	tree	365	610,000	222,650,000
A.3.2	Wooden trees	tree	5,391	30,000	161,730,000
A.3.3	Bamboo trees	bush	10	200,000	2,000,000
A.4	Assistance				24,419,030,000
A.4.1	Support to stabilize the life of affected households (6 months x 30kg/person/ month)	Person	196	1,530,000	299,880,000
A.4.2	Vocational conversion assistance	m ²	94,781	150,000	14,217,150,000
A.4.3	Transportation allowance	house	141	4,000,000	564,000,000
A.4.4	House rental allowance (6 months x 1,000,000 VND/month)	HH	141	6,000,000	846,000,000
A.4.5	Resettlement support (141 households losing their houses)	HH	141	60,000,000	8,460,000,000
A.4.6	Social assistance for vulnerable households				32,000,000
	HHs of wounded soldiers	HH	2	8,000,000	16,000,000
	HHs of having revolutionary merit	HH	3	4,000,000	12,000,000
	Near poor HHs	HH	1	4,000,000	4,000,000
B	Management costs				721,111,946
C	Sub-total				36,776,709,226
D	Contingency				7,355,341,845
E	Income restoration program				516,460,000
F	Cost for the relocation of electric lines				790,488,929
	Total				45,439,000,000

Source: Resettlement action plan of subproject, 2019

Feasibility of the measures: The subproject owner has prepared a Resettlement Action Plan, organized a consultation meeting on the subproject construction, affected peoples in the subproject area agreed on the principle of land acquisition and procedures, all households were willing to donate land for the subproject construction. So, the above solutions are practical and will be highly feasible.

Effectiveness of the measures: The subproject has allocated funds for compensation and support, the compensation also coordinated by the WB's experts, compensation steps have been approved by WB and Vietnam.

5.2.1.2. Proposed measures for UXOs risk

The subproject owner has allocated budget for UXO clearance in areas where construction items will be constructed. The subproject owner will sign a contract with the military command of Dong Thap province to conduct UXOs clearance at the construction sites. UXOs will be carried out immediately after completion of land compensation and before site clearance activities.

Feasibility of the measures: Mine clearance was assigned to a professional unit, this work has also been done a lot in other projects in the Mekong Delta in general and Dong Thap province in particular so the feasibility of the measure is very high.

Effective of the measures: There is a dedicated process for UXO clearance implemented by the Ministry of Defense, so if the procedure is followed, the risks from UXO are solved.

5.2.2. Mitigation measures for negative impacts during the construction phase

5.2.2.1. Measures to mitigate general impacts

Major impacts of the subproject will be caused by the construction of infrastructures for livelihood models and transportation of construction materials and waste. Most negative social and environmental impacts can be mitigated through measures generally applied to most other construction projects such as noise, dust, water, waste impact mitigation.

Mitigation measures specified in ECOPs (see further details in *Table 6.2*) are considered as part of the environmental and social management plan (ESMP) for the subproject (see further details in Chapter 6). The mitigation measures specified in ECOPs will be included in the bidding documents and construction contract. Typical mitigation measures specified in ECOPs include:

- (i). Dust generation and air pollution
- (ii). Impacts from noise and vibration
- (iii). Water pollution
- (iv). Impacts from noise and vibration
- (v). Management of stockpiles
- (vi). Solid waste management
- (vii). Management of excavated soil and dredged sludge
- (viii). Disruption of vegetative cover and ecological resources
- (ix). Traffic management

- (x). Interruption of utility services
- (xi). Restoration of affected areas
- (xii). Worker and public safety
- (xiii). Communication with local communities
- (xiv). Chance find procedures

a). Proposed measures for the impacts of dust and exhaust

Measures will be taken to control, minimize the impact on air quality including:

- Only use construction machines with emission levels satisfying TCVN 6438-2005
- Cover the means of transporting loose materials
- All equipment used in construction must comply with Vietnamese regulations on engine exhaust (QCVN 05: 2009/BTNMT). Prior to the implementation, the operator's vehicle documentation and emission test results will be submitted to the owner.
- Barges transporting materials to the subproject must within inspect the time, materials must be covered by canvas to avoid dropping and spreading materials on the way.
- Construction machines should use low sulfur fuel (lower than 0.5% S), encouraging contractors to use diesel with a sulfur content of 0.25%.
- Do not burn waste on site.
- Each site specifies the number of doors for the means of transportation to and from the site.
- Maintaining the speed of vehicles related to construction at 40 km/h or slower on roads within 200m of the site.

b). Proposed measures for the impacts of noise

- All equipment used in the construction must be inspected to ensure the noise level is below the prescribed.
- The construction units of dykes and culverts must commit to maintaining the equipment regularly, especially with the noise reduction part for the construction area.
- The material supply contractor must commit to regularly maintain the barges to ensure the noise level of the equipment when it comes to transportation, must be within the allowable noise range.
- In sensitive construction areas (adjacent to residential clusters, schools, etc.), the contractor must select appropriate execution time to avoid causing a nuisance to the people. Specifically: (i) at the location near the school, the time of construction will be chosen on Saturdays and Sundays, no construction will be held during studying time; (ii) at the construction sites near the residential area, construction activities are organized in the daytime only. If working at night is required, the contractor has to inform the community at least 2 days in advance.
- Arrange the means which generate noise at a suitable distance so that the noise spreading to residential areas not greater than 70dBA.

- Barges transport materials to the site at daytime only, do not work at night to avoid noise affecting people's sleep.

Feasibility of the measures: the impacts could be minimized through technical control and management, which are highly feasible. However, it does not completely mitigate and should always be monitored by the subproject owner and local authorities.

Effectiveness of the measures: Due to pre-operational verification and proper regulation, the above measures included in the bidding documents are a prerequisite for contractors to ensure that during construction Complying with National Technical Regulation on noise and QCVN 27:2010/BTNMT during construction.

c). Proposed measures for the impacts on road traffic

- In the areas where both sides of the canal have trails, no construction is taken simultaneously on both sides. Only one side will be constructed and the other will be left for people to move. Priority for construction of the roads with poorer conditions.
- At locations far from bridges across canals, temporary bridges (but quality assurance) will be arranged for people to move between the two banks.
- In areas where there is only one route when constructing the dykes, the construction units must create temporary roads for people to move through the construction area.
- In case of no temporary road, inform people about the time of construction, the absence of a temporary road and alternative directions to know and choose the appropriate direction.
- At canals that can not open temporary routes, right at the beginning of the canal, the construction units must put up signboards and arrange cadres in charge of guiding the roads in replacement for the people.

Feasibility of the measures: Proposed mitigation measures are easy to implement, not high technical requirements, suitable to the conditions in the construction area so all construction contractors can implement.

Effectiveness of the measures: By implementing all these measures, the negative impacts on road traffic will be controlled without interrupting the traffic of the people.

d). Proposed measures for the impacts on waterway

- Transportation companies have to check waterway system in advance to select appropriate barge capacity.
- Before transporting materials, the companies have to notify the plan for the current lanes and docks being allowed to be used. For the rest, they have to ask for the permission of inland waterway management units before transportation.
- The transport unit must coordinate with the river management agency to put up the signboards on the canals belonging to the transport route.
- Barges must be inspected to meet the conditions for transportation.
- Barges transported in accordance with the specified load.
- Due to small canals, barges are not allowed to travel in the horizontal canal at night to prevent accidents.
- When parking at berths at night, all means must have warning light signals.

Feasibility of the measures: Mitigation measures can be applied through technical control and management, which are highly feasible. However, it is not completely mitigated and should always be monitored by the subproject owner and the local authorities.

Effectiveness of the measures: It is a common practice for the construction units so the capability to apply to the reality is high. The application will limit great impacts on waterway traffic to ensure safety and avoid accidents.

e). Proposed measures for the impacts on socio-economy and security

- Put the information board at the subproject site, clearly state the name and contact number of the Site Manager so that people can contact in case of any recommendations or complaints about security, environmental or health problems related to construction activities. Records of grievances, complaints and how to resolve them have to be retained and kept available to the Monitoring Engineer and the PPMU.
- Inform the people about the progress of construction, the temporary disruption of utility services, public services.
- Officials participating in technical supervision and construction on site must be declared temporary residence/temporary absence. These officials should respect the culture and beliefs of local people, not to cause special disturbances to the belief of local people.
- When conflicts occur, the Contractor and the Subproject Owner must coordinate with local authorities to solve conflicts on culture and interests.
- Gambling is strictly prohibited in the camp. Site managers are responsible for supervising and controlling the camps so that they do not get drunk in the camp and on the site.
- Notify local people about construction progress, temporary disruptions of services.
- Restrict construction activities at night. If construction can not be avoided at night, notice to the community at least 2 days in advance and repeat one day prior.
- To minimize the impact of workers on the community, the following measures will be taken:
 - The contractor is encouraged to hire local labors to perform simple tasks. In case of hiring labors from other places, the temporary residence must be registered for workers. Organize training on health, safety and environment for workers before assigning work.
 - The contractor's workers will be prohibited from carrying out the following behaviours:
 - (i) cutting trees outside the construction site, burning waste and vegetation after clearing;
 - (ii) causing disorder, hygiene in cultural and historical buildings; (iii) voluntarily set fire outside the camp; (iv) to arbitrarily drive a vehicle, machine or means of construction; (v) use alcoholic beverages during working hours; (vi) Littering on the site of maintenance of vehicles, construction machines and equipment outside the permitted area; and (vii) bickering, fighting and causing public disorder.

Feasibility of measures: This is a common management measure in society so it is high feasibility, all units can be applied.

Effectiveness of measures: Applying measures will minimize negative impacts on socio-economic development, social order and security.

f). Proposed measures for solid wastes management

- For domestic wastes:
 - Provide rubbish bins for workers to throw domestic waste.
 - For recyclable waste that will be classified for recycling;
 - For organic waste, will coordinate with people near the construction site to dig holes to compost green-fertilizer.
- For construction wastes:
 - All construction waste must be collected for proper disposal treatment, not to be released into the natural environment, especially canals.
 - For the construction formwork of the sewers, must be taken out of the construction site when completed.
 - For construction waste such as sand, excess rock, can be used to reinforce dikes or other items connected to the sewer.
 - Cement bags must be collected to be recycled or sold to scrap collectors to re-use. It is strictly forbidden to be disposed into the natural environment, especially in the canal.
 - Arrange material yards on the construction sites to avoid dispersing materials into the surrounding environment.
 - When completion, have to clean the site; for the excess material, have to be removed out of the subproject area to serve other construction sites.
 - Excessive sand in construction must be collected and removed from the site.
- Hazardous wastes:
 - The contractors, the transportation companies supplying materials for construction must organize the collection of all lubricants each time they are replaced then stored and transported to the establishments having regenerative functions in accordance with regulations in Circular No. 36/2015/TT-BTNMT.
 - Fuel containers must also be disposed of in accordance with the hazardous waste regulations. Do not directly dispose of the environment nor sell with other waste.
 - Sign contracts with the company are able to treat hazardous waste to collect and process periodically.
 - The Contractors must notify the supervision consultant and the management board of any spill or accident; take appropriate troubleshooting action if necessary;
 - Provide a report explaining the cause of the spill or incident, the troubleshooting action, consequence/damage of the incident, proposed remedies.

Feasibility of measure: All construction contractors can implement all of those measures through technical and management solutions. They are non-complex and have been widely applied in many sites so their feasibility is high.

Effectiveness of the measure: All proposed mitigation measures should be included in the bidding documents and will be a contract clause of the package as a basis to ensure the compliance of the contractors. Applying the measures will reduce the negative impact of the waste generated by the construction activities. However, the effectiveness depends greatly on

the level of the contractor's compliance so the subproject owner has to regularly control throughout the construction phase.

g). Proposed measures for water pollution

- For domestic wastewater: At the construction camps, portable toilets must be installed. Periodically, construction units must sign a contract with urban management departments of Tam Nong, Hong Ngu, Thanh Binh districts and Hong Ngu town to suck septic tank to the place where processing properly.
- For water washing concrete mixing equipment can be used to irrigate the land surface of the sites of new dykes to reduce dust emissions, cement in the wash water can slightly increases the linkage of land on the new dyke.
- For the surface of the old dike excavation, the vegetation cover should be created immediately after completing excavation.
- Soils scattered from the old dyke should be collected and compacted to avoid washing out during rain.
- Domestic waste must be collected according to the regulations on the site, not letting domestic solid wastes and wastewater spread to the surface of construction works as well as to canals. The organic waste will be treated by digging holes for composting green-fertilizer next to the site. Non-organic waste will be collected and sorted: recyclable waste will be collected by the collector; non-recyclable waste will be concentrated and periodically transported to the waste treatment plant of Tam Nong, Hong Ngu, Thanh Binh districts and Hong Ngu town.
- The construction equipment must be controlled not to drop machine oil into the environment.

Feasibility of the measure: All construction contractor can implement through technical and management solutions as they are not complicated. The solutions have been widely applied in many sites so the feasibility is high.

Effectiveness of the measure: All proposed mitigation measures should be included in the bidding documents and will be a contract clause of the package as a basis to ensure the compliance of the contractors. Applying the measures will reduce the negative impact of the waste generated by the construction activities. However, the effectiveness depends greatly on the level of the contractor's compliance so the subproject owner has to regularly control during the construction phase.

h). Proposed measure for labor influx

To mitigate impacts due to labor influx of the subproject, the subproject workers must to implement the Codes of Conducts during construction time as follow:

- Compliance with applicable laws, rules, and regulations, with applicable health and safety requirements;
- Prioritise the use of local labours, particularly ethnic minorities
- The transportation, storage and use of illegal substances including weapons are prohibited;
- Do not involve in social evils. Do not quarrel or fight that cause social disorder

- Do not catch, hunt, trade, keep in cage or usage of wildlife or wildlife products. Do not bring domestic animals in camps
- Do not use alcohol during working hours, smoking at the construction site is prohibited;
- Non-Discrimination (for example on the basis of family status, ethnicity, race, gender, religion, language, marital status, birth, age, disability, or political conviction)
- Interactions with community members with an attitude of respect and non-discrimination)
- Sexual harassment (for example to prohibit the use of language or behavior, in particular towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate) is prohibited
- Violence or exploitation (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior) is prohibited
- Protection of children (including prohibitions against abuse, defilement, or otherwise unacceptable behavior with children, limiting interactions with children, and ensuring their safety in project areas)
- Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection)
- Respecting reasonable work instructions (including regarding environmental and social norms)
- Protection and proper use of property. Maintain sanitation and safe conditions in both camps and construction sites. Prohibit theft, careless usage of resources, set fire without being authorised or pollute the environment
- Duty to report violations of this Code
- Violations of the Codes of conducts will lead to disciplinary actions

Feasibility of the measure: All measures can be implemented through technical and management solutions, as they are not complicated. The solutions have been widely applied in many sites so the feasibility is high.

Effectiveness of the measure: All proposed mitigation measures should be included in the bidding documents and will be a contract clause of the package as a basis to ensure the compliance of the contractors. Applying the measures will reduce the negative impact of the waste generated by the construction activities. However, the effectiveness depends greatly on the level of the contractor's compliance so the subproject owner has to regularly control during the construction phase.

i). Proposed measures for ensuring security and health of workers and community

- Carry out training on safety, hygiene and health for construction workers before commencing work.
- Provide workers and laborers with protective clothing (gloves, dust masks, boots, glasses, etc. Depending on the nature of work).
- Organize training for workers to raise awareness of HIV/AIDS and epidemics in the region.
- The camp area should arrange mosquito nets to limit the diseases caused by mosquito.

- Coordinate and cooperate closely with the localities to make good community hygiene when symptoms of the disease appear in the area.
- Coordinate and cooperate with local authorities in preventing and combating social evils.
- Upgrade the construction area elevation of pumping stations and sluices up to least 2 meters high.
- Install barriers, fences, signs at open holes, ensuring lighting at night when upgrading embankments and overflow passage.
- Implement necessary measures to ensure absolute safety for construction workers and communities at the construction site.

Feasibility of the measure: All measures can be implemented through technical and management solutions, as they are not complicated. The solutions have been widely applied in many sites so the feasibility is high.

Effectiveness of the measure: All proposed mitigation measures should be included in the bidding documents and will be a contract clause of the package as a basis to ensure the compliance of the contractors. Applying the measures will reduce the negative impact of the waste generated by the construction activities. However, the effectiveness depends greatly on the level of the contractor's compliance so the subproject owner has to regularly control during the construction phase.

j). Proposed measures for chance find procedures

There are also no important historical and cultural sites identified in the subproject construction sites. There are schools, residential areas near the construction sites but impacts on them are likely small and to mitigate potential noise impacts, equipment with low noise signatures will be used, and if necessary, noise barriers will be installed. No adverse impacts on other historical and cultural heritage features are expected during the construction phase of the subproject. However, to deal with chance finds during the construction phase, a chance find procedures are developed for the subproject. If the Contractor discovers archaeological sites, historical sites, ruins and other objects, including family graves and/or individual graves during excavation or construction, the Contractor should:

- Stop construction activities where it has been exposed;
- Preliminary description of the area or site discovered;
- Protect the area so that it does not damage or lose any movable objects. In the case of moveable antiques or sensitive ruins, night protection must be provided until the provincial authorities or the provincial Department of Culture, Sports and Tourism, or Archaeological Institute to take over;
- Notify the Supervision Engineer, who will immediately notify the subproject owner, responsible local authority and Institute of Archeology (within 24 hours or less);
- The local authority will be responsible for protecting and preserving the site before deciding on the appropriate procedures.
- Implementation of the competent decisions related to the management of the findings will be notified in writing by the relevant local authority.
- Construction work at the site can only be resumed after permission from the responsible

local authority and the Dong Thap PPMU related to the safeguarding of the heritage.

Feasibility of the measures: All measures can be implemented through technical and management solutions, as they are not complicated. The solutions have been widely applied in many sites so the feasibility is high.

Effectiveness of the measures: proposed measures in accordance with the customs and beliefs of the Vietnamese people.

5.2.2.2. Measures to mitigate site-specific impacts

a). Site-specific measures of canal dredging

- Preparing the dredged material disposal plan (DMDP) for dredging (see detail in Appendix 7)
- Dredging method: Use water-filled bucket excavator to minimize turbidity and water disturbance in the dredging area.
- Installation of lighting at night must be done if this is necessary to ensure safe traffic circulation.
- Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning.
- Employing safe traffic control measures, including canal signs and flag persons to warn of dangerous conditions.
- When dredging below wooden and iron bridges with clearance elevations lower than the height of the dredger, the constructor must temporarily remove these bridges (*Figure 5.1*) and inform alternative bridges for local people a week before dredging. In case there have no alternative bridges, the constructor must install temporary bridges for local people movement.

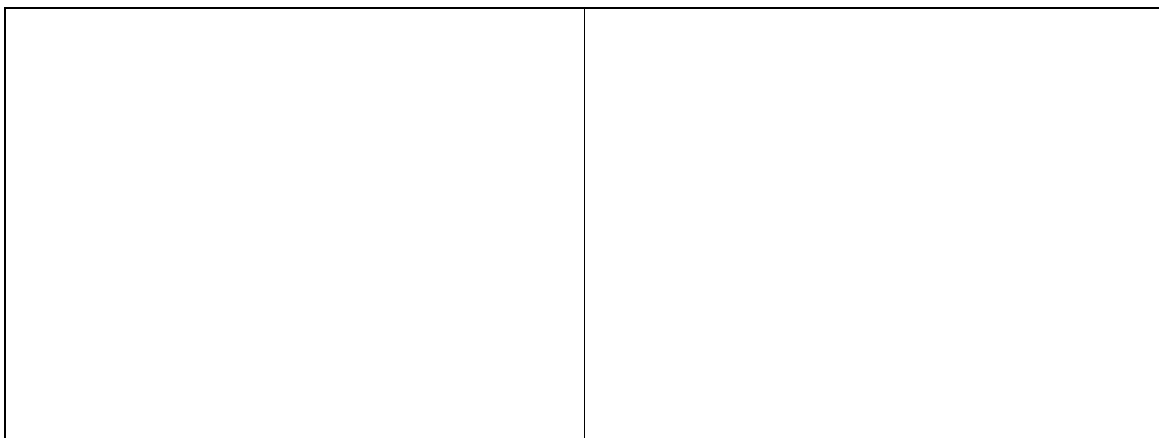


Figure 5.1: Removal of bridges with clearance elevations lower than the height of the dredger

- Inform alternative roads for local people a week before dredging where the pipelines of the suction dredger cross over the roads.
- Arrange appropriate construction time. In case of people's aquaculture in the radius of 1-2km who need water for aquaculture, do not dredge at the peak tide.
- Prior to pumping dredged sediment into dump sites, the Subproject Owner will notify the local authorities about the dredging plan.

- Operate dredging bucket in accordance with the process and speed to limit disperse of sediment when collecting bucket too fast.
- Tug boats, barges transporting sediment into dump sites will be covered to prevent odors into the surrounding environment during transport. Sediment should be transported within the permitted capacity of barges to avoid leakage into canals on the way. This measure will reduce odor to the environment about 40-70% if without covering during the transport.
- Do not pump the sediment into the dump sites at night, if there are complainants about foul odor from the dump sites, the construction teams must consider stopping the construction to take appropriate measures.
- In order to minimize impacts from dredging activities to aquaculture water-taking by users, when preparing the construction, the construction companies should coordinate with local people to inform the construction plan, construction time and time to stop construction on the local media to the aquaculture farmers to plan to take water before the construction time or not when the water sources are affected by dredging.
- The results of sediment analysis show that the metal concentration in the river sediment meets the environmental standard which can be used for planting and leveling after dewatering.
- The Subproject Owner require the Contractors in charge of dredging to regularly inspect dump sites, dredged sediment, especially after heavy rainfall to consider damages caused by the flow, soil erosion or deposit. Simultaneously, restore the premises before completing the works.
- The Subproject Owner requests the Contractors to keep sediment and spoil management records including the amount of sediment, dredged soil and reused quantity, composition and properties of sediment, how to treat, names and addresses of sediment receiving sites where sediment is used.
- A dumpsite must have at least 2 compartments (sediment compartment and settling compartment) to increase the retaining time in site. Wastewater must be stored in the compartment for at least one day to let small sediment settle.
- At the outlets, bamboo and sand-bags will be strengthened to avoid water discharge to cause a landslide.
- The embankment should be higher than the design 20cm and the safety coefficient is 1.1 to avoid when pumping sediment out, it is overflow when it is filled. The pumping process starts from a distance far from the sluice gate and connects pipes gradually to the sluice gate to ensure the maximum retention time of water in a dumpsite.
- Monitor water source from a dump site sluice gate to not pollute the surface water environment. If the water quality does not meet the standard, the construction teams must stop pumping and wait for the SS settling to not exceed the allowed standard.
- Regularly monitor maintenance and inspection of embankments of disposal sites daily and check seepage. To ensure safety when operating the outlets, the construction teams arrange at least 20 soil-bags at an outlet.
- Set up barriers and signboards that prohibit people, especially children, from entering the dump sites.

- In case of sediment and water spillage from the dump sites to the environment, the construction teams shall take measures to stop the incidents and work with local authorities to compensate for damages.
- Temporarily suspend all dredging works in case of heavy rain or any emergency.

Feasibility of the measures: These are common measures the construction companies can apply in construction.

Effectiveness of the measures: The measures are applied at the same time. Although we cannot fully control sediment to emit water during dredging, it will minimize the risk of turbidity to ensure that the Subproject makes a less negative impact on the water environment.

b). Minimize the risk of erosion caused by dredging

- Monitoring embankment erosion during dredging.
- Sending staff to observe daily erosion during the construction phase.
- Construction of the slope in accordance with the design to ensure the stability of the flow.
- Construction of the route has been determined, avoid construction on one side.
- During the construction process, if there is phenomena or risk erosion, the construction companies should suspend the construction and report the Subproject Owner and the specialized units to survey the impact and take appropriate measures.

Feasibility of the measures: This work that can be done through the supervision of the construction companies, the construction supervision units but the assessment of the cause of the landslide is more difficult and needs time for measurements to identify the exact cause.

Effectiveness of the measures: Applying measures will reduce the risk of landslides across large areas, therefore, we can overcome immediately to reduce negative impacts.

c). Mitigation measures for the construction of medium voltage lines

In order to ensure safety in the construction as well as operation of the medium voltage lines, the subproject owner will manage and supervisor the design consultants to ensure that the connection lines of the medium voltage to pumping stations that fully meet the safety regulations for the construction of medium voltage hubs as provided for in the Electricity Law and related decrees as below:

- Ensuring electrical safety; construction safety; Safety on fire prevention and fighting and meeting the regulations on environmental protection.
- Having all technical design documents, construction drawing designs, construction and installation completion documents, inspection, adjustment and hand-over to the units for management and operation;
- To ensure proper safety distance during construction, the minimum height of the electric pole, the inter-column distance, the distance from the lowest point of the electric wire in the maximum sag condition to the ground, full discharge; Meet the regulations on the safety corridors of overhead power transmission lines.
- Defining the safe distance for tree planting and house building under the power transmission line.

- Using insulated wires in all connecting lines to increase safety when putting into use. Only hand over the lines to the operation organizations who have been trained in electric safety (trained in the process of operation, handling electrical wiring incidents and electric equipment where laborers work, safety procedures for inspection, maintenance, repair, testing of power lines...)

d). *Mitigation measures to natural and important socio-economic receptors*

As shown in *Table 1.9 and Table 1.10*, sensitive and socio-economic receptors in the subproject area include Tram Chim NP, schools, markets, wharves and health stations, therefore measures should be implemented when constructing near these areas (*Table 5.3*) as follows:

Table 5.3: Mitigation measures for important natural and socio-economic receptors

No.	District	Receptor	Mitigation measures
1	Tam Nong district	Tram Chim NP	<ul style="list-style-type: none"> - Strictly forbidden to dispose of domestic and construction wastes into water sources - Strictly forbidden to hunt animals in the forest - Do not burn waste at the site - Ensure noise from the construction site to the NP is 55dBA in daytime. - Do not build at night. - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge
2	Hong Ngu town	Binh Thanh and An Binh primary schools	<ul style="list-style-type: none"> - Inform the schools about the construction plan and the impacts caused by the construction to the schools such as dust and noise a month before the construction. - Do not burn waste at the site. - Spray water to prevent dust on sunny and windy days. - Resolve immediately the problem caused by the construction to the schools. - The means of transporting construction materials, equipment when going through the school must go at a speed of 15km/h - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge - Ensure noise from construction
3	Tam Nong	Phu Thanh A, Phu Thanh B Primary	

	district	School	site to school is 55dBA in daytime.
4	Thanh Binh district	Phu Loi Primary School and Phu Loi Secondary School	
5	Thanh Binh district	Phu Loi Commune Health Station	<ul style="list-style-type: none"> - Arrange traffic regulators at the construction site - Do not work at night - Ensure the noise level from the construction site to the medical station is 55dBA during daytime. - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge. - Spray water to prevent dust on sunny and windy days.
6	Tam Nong district	Phu Thanh A ferry	<ul style="list-style-type: none"> - Arrange traffic regulators at the construction site. - Spray water to prevent dust on sunny and windy days. - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge.

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Feasibility of the measures: All measures of the Construction Contractors are feasible to implement through technical and management solutions; non-complex solutions have been widely applied in many sites with high feasibility.

Effectiveness of the measures: All proposed mitigation measures should be included in the bidding documents and will be a contract clause of the packages as a basis to ensure strict compliance of the Contractors. Applying measures will reduce negative impacts on natural and socio-economic objects caused by construction activities. However, the effectiveness of the mitigation measures depends very much on the compliance of the Contractors; therefore, the Subproject Owner will regularly control the compliance of the Contractors during the construction period.

5.2.2.3. Mitigation measures for environmental accident and risks in the construction phase

a. Labor accidents

The measures to manage and prevent labor unsafety and health incidents during construction include:

- For human:

- All workers get the medical check-up regularly and are trained on labor safety and sanitation in accordance with Circular No.37/2005/TT-BLDTBXH dated 29/12/2005 of the Ministry of Labor Invalids and Social Affairs and the measures to ensure safety in accordance with TCVN 5308 – 91. The training focuses on local people to participate in construction. After completing the training, workers will be listed and get labor safety cards.
- All workers working on the site always comply with the regulations on labor safety and health according to TCVN 5308-91 on technical safety rules in construction.
- Equip with tools to ensure labor safety such as dust masks, boots, gloves, helmets in accordance with TCVN 2287-78.
- Workers are not allowed to leave the equipment while the equipment is in operation.
- Provide adequate clean water for workers on site.
- Train on response and handling of a bad situation on labor safety at work site, rescue equipment, first aid, etc.
- For workers involved in the transportation of materials by waterway, life jackets must be provided in the event of a boat accident.
- The construction areas near canals, ditches must be fenced off to protect workers from falling into canals, ditches.

- For construction equipment:

- All construction equipment on site complies with Standard 2290-78-Production equipment.
- Construction machinery and vehicles are issued with registration and verification by the competent authority.
- Conduct salvage boats, barges, pick up items, goods on means of transport to not obstruct waterway traffic. Rescue of chemical leakage according to national standard QCVN 17: 2011/BGTVT-National technical regulation on prevention of pollution by inland waterway means.
- Conduct traffic regulation; guard at two-ends of the incident area; install forbidden signboards in the incident area. When the traffic is remained, set up navigation station that guides the waterway means through the area safely.

b. Waterway accidents

- The means of transport involved in transporting materials must meet the technical requirements.
- The transporters must conduct a survey of the transport route before carrying out material to arrange suitable means of transport to the flow characteristics.
- Organize full signage to guide waterway traffic.
- Because the waterway is quite narrow, no overnight transport is organized, especially for horizontal canals.

c. Fire and explosion risk

During the construction, if any fire or explosion occurs, the construction company must immediately rescue the objects in the danger area. Actively isolate the fire/explosion point by the facilities at site (water, fire extinguisher, etc.). Organize workers to participate in fire fighting under the direction of functional units (can be contacted remotely) until the authorities are present in the field. Coordinate with local authorities to establish a safety belt around the hazardous area. Check fire safety condition at site to ensure no continuous incidents.

Feasibility of the measures: simple, easy to implement, highly feasible.

Effectiveness of the measures: The measures depend very much on the compliance of the Contractors and the employees on site. These measures will be included in the bidding documents and will be an environmental clause in the construction contracts.

5.3. MITIGATION MEASURES FOR NEGATIVE IMPACTS OF NON-STRUCTURAL WORKS

5.3.1. Adjustment of land use planning in accordance with the proposed models

As mentioned above, when the subproject comes into operation phase, there will be a shift in the land use purpose of a number of rice cultivation areas which will be changed to into rice-aquaculture or rice –other cash crop. In order to have a legal basis for the exploitation and use of land, Dong Thap DONRE will organize land use planning for the subproject area in

management and development orientation. The planning will ensure the correct use of land and livelihoods models proposed by the subproject, focusing on:

- Clearly define the area and purpose of land use in consistent with the models as follows:
 - Model 1: 2 rice crops, 1 natural fish.
 - Model 2: 2 rice crops, 1 giant freshwater shrimp.
 - Model 3: 1 rice, 1 cash crop, 1 natural fish.
 - Model 4: 2 rice, duck, natural fish.
 - Model 5: 1 rice, 1 natural fish, aquatic plants (lotus, *Sesbania sesban*).
 - Model 6: 2 rice, 1 shrimp, natural fish.
 - Model 7: lotus, cultured fish, tourism combination.
- Local authorities need to manage the adjusted land use planning for production management in line with the planning and scale of production proposed in the Subproject.
- Based on the results of the models, the actual demand and the ability of the market expansion, especially the production demand of local people, local authorities will propose to the Project Owner to maintain or continue to expand the production models in line with water resources and infrastructure.

5.3.2. Development of brand and trade for products

- Market forecasts for output products such as giant freshwater shrimp, rice, fish and lotus for production in line with consumption market.
- Branding for the products of giant freshwater shrimp, rice, fish, lotus, and aquatic plants is the driving force for this development.
- Find the stable output for giant freshwater shrimp, rice, fish, lotus, and aquatic plants through trade promotion to introduce products on domestic and overseas fairs.

5.3.3. Guiding advanced techniques for production

Organize training classes on how to transfer to new livelihood models for local people through the introduction of theory and guidance on the models and sending agricultural extension teams to guide farmers on site when there is a need. The guidelines must be suitable for the knowledge and skills of people.

5.3.4. Planning and improving infrastructure to divide the area into compartments having similarities in water use

- Converting production may lead to conflicts over water use in the W/S – floating rice – natural fish and current production. In order to minimize conflicts, in addition to the development of production models, regional planning solutions of the same time of water use to avoid conflicts in water use should be applied. Therefore, the conversion should be carried out synchronously in each new apartment to avoid conflicts in water use.
- Propagate and mobilize people to raise the sense of protecting the quality of water sources, forecasting the quality of water sources to ensure the downstream production.

Feasibility of the measures: These are mainly management measures directed by state management agencies. This is the policy of the province and the district as well as the commune so the management measures will be implemented when operating the subproject and are highly feasible.

Effectiveness of the measures: Applying solutions will be the motive force for production in the area in accordance with the objectives of the Subproject to contribute to maximizing the construction works for production, raising livelihood for local people.

5.3.5. Waste management from the livelihood models

5.3.5.1. Wastes from aquaculture models

- Planning the farming area for *macrobrachium rosenbergii*, natural fish and fresh fish in accordance with the water conditions and infrastructure in the region.
- Do not concentrate on large-scale farming, only maintain as maximum as 50% of the water surface to ensure that waste is dispersed and diluted with flood water.
- Do not develop shrimp and fish farming in industrial scale but only in improved extensive farming (maximum density of 3 – 5 fish/m²). This density, affection from shrimp and fish farming to the environment is small.
- Solid waste from fishery activities must be collected and treated in accordance with the regulations.
- Restrict the use of antibiotics in shrimp and fish farming, especially the use of drugs banned under Circular No.08/VBHN-BNNPTNT dated 25/02/2014 of the Ministry of Agriculture and Rural Development.
- Do not develop specialized shrimp in the region but should follow the orientation planning for the development of the rice-shrimp model.

Effectiveness of the measures: Applying the measures will limit negative impacts on aquaculture activities and contribute to stabilizing production and diversifying cultured species and people's incomes.

5.3.5.2. Wastes from rice cultivation

- Widely organize extension agriculture courses to introduce IPM to farmers. The details are as follows:
 - Step 1: Establish a control threshold, where pest populations or environmental conditions indicate that pest control is necessary. The extent to which pests become an economic threat is the limit to making pest control decisions.
 - Step 2: Monitor and identify types of pests. Do not kill all insects or weeds. Many species do not harm, even some species are beneficial. This will eliminate the possibility of using pesticides.
 - Step 3: Prevent by such measures as crop rotation between different crops, select high resistant varieties with pests. These measures are more effective, less costly, less harmful to human health and the environment.
 - Step 4: Prevent and identify pests and the control threshold points out that pest control is necessary. Through the IPM, one will evaluate and select appropriate solutions to both

effect and risk. The less risky, effective solutions will be chosen first, like pheromones that kill males, breed, sanitize the field, etc.

- Organize the application of the “one must five reductions” program for people to understand as well as practice in reality as follows: the “one must, five reductions” program is based on the “3 increase, 3 reduce” program which was recognized by the Cultivation Department as new technological advances in the rice production in Vietnam. Accordingly: “1 must” means using certified seeds and “5 reductions” means reducing the amount of seeds, excessive nitrogen fertilization, chemical pesticides, irrigation water and post harvest losses.
- Provide technical guidance and organize experimental production of floating rice, organic rice, rice without plant protection drugs in the subproject area so that people can learn and apply through practice.
- Thoroughly cultivate the development of the macrobrachium rosenbergii - rice model without using plant protection drugs in the rice crop, not only reducing the environmental impacts but also protecting the environment for shrimp farming.

Feasibility of the measures: These measures have been successfully applied in the agricultural production area, therefore the feasibility is very high.

Effectiveness of the measures: Applying measures will limit the negative impact of the rice production on the environment, contributing to the production of clean agricultural products, producing sustainable ecological models, improving product quality and contributing to improving people’s income.

5.3.6. Addressing Social Vulnerability for livelihood models

- Preparation for farmers to implement livelihood models:
 - Provide in-depth knowledge on technical aspects of production by applying the Farmer Field Farming School (FFS) approach with local farmers on technical knowledge as well as hand-on training on ways to convert to new livelihood models. Key activities will include, but not limited to, (i) undertaking a series of technical workshops to provide basic knowledge on technical issues related to on-farm management as well as clear explanation on ways to convert to the new models; (ii) setting up a group of qualified agricultural/aquacultural extension officers who can provide direct guidance to local farmers when they require through a “Training-of-Trainer or TOT” program including preparation of technical guidelines and/or manual that could be used to equip local farmers people enough knowledge and techniques when new models are introduced in the area; and (iii) establishing farmer networks through a series of study visits to appropriate areas so that farmers could have opportunities to exchange knowledge and implementation experience that could help to enhance the quality of the model application.
 - Locate pilot livelihood demonstrations near successful models in order to change farmer’s risk perceptions.
 - Use farmer cooperatives or collective groups to implement livelihood adaptation models
 - Start-up capital needs to be provided to fund the livelihood investments
 - Develop predictive decision support tools that can provide farmers with early warning of droughts and floods

- Reduce the risk of over-supply by working with agribusinesses on a staged incremental approach.
- Increase the diversity of adaptation models
- Share and transfer lessons and experience between subprojects
- Developing organic products to diversify markets
- Mass organizations should play a central role in supporting farmers
- Encourage agribusinesses to establish hatcheries capable of producing high-quality aquaculture seed as close as possible to the sub-project sites
- Livelihood support for the landless in the subproject area is established or extended from existing development programs
- Encourage agribusiness (particularly vertically integrated companies) companies to extend their value chains to create employment opportunities for the poor.
- Extension training programs ensure that they are done in a manner and time that allows women to adequately tend to their domestic duties, ie. childcare, meal preparations, etc.

5.3.7. Risk of weather fluctuations to the models

- For floating rice and shrimp farming areas, the half-way dike solution must be strengthened to mitigate impacts in non-flood years like in 2015, when the producers could pump water from canals into their production area of floating rice or *macrobrachium rosenbergii* shrimp farms to maintain production.
- Shrimp farmers should build a system of permanent nursery nets, ensuring no loss of shrimp when floods come.
- The agricultural and fishery extension agency shall guide the transfer of shrimp farming techniques, including solidified techniques for making nursery nets for people to apply.

5.3.8. Risk of disease in aquaculture

- The Dong Thap DARD together with the local veterinary agency control tight source of fingerlings of shrimp in the area.
- Nurseries of high quality male breeding freshwater shrimp have been quarantined for supply to breeding areas.
- Do not develop too concentrated aquaculture areas, especially within an area where no more than 50% of the water surface is cultivated.
- When an epidemic virus disease is detected, the infected shrimp should be immediately destroyed to cut off the source of the disease.
- Local authorities coordinate with the insurance agency to create an insurance market for farmers in case of trouble.
- In the case of epidemics, the local authorities should declare the epidemic and adopt a policy to support the farmers to restore production.

5.3.9. Mitigation measures for negative impacts during the operation phase

5.3.9.1. Mitigate the risk of damages of the embankment, pumping stations and culverts

- Contractors must comply with the technical standards as designed and have independent units that monitor the quality of the works.
- The irrigation management agency together with the local authorities and people regularly check and maintain the works every year to ensure the stable dike as well as the system of culverts and pumping stations.
- The separation of water sources must be carried out for the aquaculture model of two rice production models at the beginning and the end of flood season.

5.3.9.2. Measures the risk of traffic accidents

There are concerns about the risks of traffic accidents in the operation phase of the subproject. It is concerned about the risks of traffic problems caused by the 77.89km of strengthening semi-dikes in operation phase. Installing signs, safety instructions to minimize the potential for increased traffic accident accidents.

CHAPTER 6. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

On the basis of the assessment of negative impacts presented in Chapter 3 and the measures of impact mitigation recommended in Chapter 5, this Chapter will present the ESMP and monitoring plan, taking into account the compliance with the provisions of the Government's ESIA and safety policies of the WB.

ESMP's mitigation measures are divided into 3 basic parts: (i) ECOP; (ii) Specific mitigation measures for the specific types of works, and (iii) Site-specific mitigation measures for each sensitive receptor to be affected by the subproject's works items.

- (i) All of the potential negative impacts on the physical, biological, and social environment could be mitigated through a set of general measures that are typically applied to most of the construction projects to minimize impacts such as noise, dust, vibration, waste generation, traffic hindrance, public safety, etc. In this context, an ECOP has been prepared to describe specific requirements to be carried out by contractor to mitigate the subproject potential impacts considered to be general impacts. The contractor will also be required to mitigate site-specific impacts which will be identified to address issues specific to the subproject.
- (ii) In addition to adopting the ECOP, specific mitigation measures are identified for addressing the impacts associated with the specific types of works under the subproject such as dredging canals, strengthening spillways and semi-embankments, building sluices and pump stations. These measures will be included in the contracts for corresponding packages.
- (iii) Site-specific mitigation measures will need to be included when the impacts specific for each sensitive receptor of which mitigation measures could not be addressed through the implementation of the ECOP.

Measures to mitigate the negative impacts of land acquisition are detailed in the Resettlement Action Plan of the subproject and these will be implemented and monitored separately.

6.1. SUMMARY OF POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF SUB-PROJECT

6.1.1. *Positive impacts*

6.1.1.1. *Positive impacts of structural works*

Two main types of investments have been proposed in this subproject, including structural works and non-structural works. The proposed structural works include canal dredging, embankment and spillway lining/strengthening and rehabilitation or construction of sluices and pumping station. Non-structural works are related to agricultural production demonstration models. Implementation of the subproject will bring positive impacts for the subproject areas as follows:

Impacts on drainage and flooding: The dikes in the region are identified as the August dikes with the purpose of preventing early floods to protect production in combination with the open culverts, underground culverts, pump stations and spillways at the head of main canals people can take initiative to collect and drain water at late flood seasons to promote production. During main floods, the dikes will be flooded and flood water is drained via spillways into fields and culverts to increase flood drainage and develop the livelihoods in the

direction of flood exploitation. As a result, the Subproject basically neither prevent main floods nor change the flood situation compared with the current status of soil dikes. The only difference is that thank to the strengthened dikes (reinforcing of dikes, construction of open culverts, underground culverts, and spillways), people will actively bring flood water into their fields at beginning flood seasons, store and take initiative in draining flood water at ending flood seasons to reduce damages compared to the current soil dikes.

Ensuring social development. Subproject implementation will include developing plans to help the population in the subproject area, including: (i) contribute to local employment during the flood seasons: previously, when floods come, local people leave their fields to other provinces to find jobs. When implementing the subproject, people can continue to make a living with suitable models of their own or work for other aquaculture households, which contribute to stabilizing the local economy; (ii) improve the road network of the subproject communes and districts: the current state of the semi-dikes is mostly soil or macadam roads. The road surface is only 0.4 to 0.8m wide. Pedestrians and motorcycles on roads are not convenient, especially when it rains. When floods start the roads are completely useless. The Subproject will carry out dike reinforcement; therefore, they will be roads for residents in dry seasons, early flood seasons and late flood seasons. Thus, the subproject implementation will improve road traffic condition compared to the current status. The roads also serve people to transport raw materials for rice production in dry seasons and agricultural products when harvesting.

Contributing to economic development: Thank the system of August flood control as semi-dikes, open culverts, underground culverts, spillways, the flood time will be slower and more stable. People are peaceful to have enough time to grow another cash crop or rice crop, etc. after the W/S crop. In addition, the diversification of crops such as the models of vegetables, aquatic plants and lotus plants will diversify agricultural products, increase the value of rice production.

6.1.1.2. Positive impacts of non-structural works

Improving environmental pollution and risks: Thank the rotation with other crops or other aquaculture models instead of specialized rice cultivation as before, it contributes to the reduction of pest and disease outbreaks in the next crops as well as reduces the use of plant protection chemicals in the next crops. In addition, the production of rice under IPM and aquaculture under VIETGAP standards will increase the soil nutrition, reduce pests, reduce the amount of fertilizer for rice in the next crop and increase profits for farmers.

6.1.2. Negative impacts

For structural works:

- During the preparation phase, the subproject will cause impacts on the environment and local people in the subproject area. The subproject will acquire land from households and affect the living and production of the people. The removal and clearance of buildings and structures out of the subproject area will generate negative impacts on the environment. In addition, within the subproject site where residue UXOs, the risk of UXOs will affect the quality of the work and life of workers and people around the construction site. However, these impacts will be mitigated through the implementation of compensation and resettlement in line with the policy set out in the RPF of MD-ICRSL project and RAP of

this subproject. The subproject owner will be contracted to the UXO clearance authority and the contractor will only carry out if the construction sites are safe.

- During the construction phase, there will be negative impacts including vehicle and equipment exhaust emissions, smoke, dust and noise from construction equipment during the construction of the subproject components, wastewater from construction workers and construction activities, construction solid waste, dredged sludge and some contaminated waste, among others. These have been identified in the ESMP. These impacts can be mitigated by ensuring that the subproject contractors comply with the provisions of their contracts, including those which relate to environmental impacts. The PPMU and their CSC and EMC will be responsible for ensuring that this compliance occurs. In accordance with their contracts, contractors will be required to prepare the Contract Specific Environmental Plan (CSEP) describing detailed environmental safeguard actions. The CSEP will be approved by PPMU and supervised by CSCs prior to the work commencing. Periodic monitoring reports will be prepared by the EMC and the results will be submitted to CPMU and the World Bank (as needed).
- During the operation, the Subproject will cause such negative impacts as damages to embankments, culverts, pumping stations...

For non-structural works: the negative impacts related to wastes from the implementation of the livelihood models, which will affect the psychology and income of people. There may be impacts from disease risks, water conflicts among the areas implementing the livelihood models. However, these impacts will be minimized through training to raise public awareness of the impacts of waste, diseases, experiences in implementing livelihoods models, linking and forecasting the market. Propaganda and education to raise awareness of the protection of the works will ensure long-term operation and the environment is always well protected. Developing brands for goods from livelihood models, marketing and expanding output markets and production area planning for management and control while controlling the environmental impacts will be implemented at the same time.

6.2. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.2.1. During the preconstruction phase

Mitigation measures during the pre-construction phase are summarized in *Table 6.1*.

Table 6.1: Mitigation measures during the pre-construction phase of the subproject

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
I	During pre-construction phase						
1	Land acquisition	The subproject will acquire 10.077ha of land, in which 9.48 ha of agricultural land. There are 366 households affected, 141 houses to be relocated	<p>Land acquisition and resettlement will comply with approval RPF of ICRSL project and RAP of the subproject, specifically:</p> <ul style="list-style-type: none"> - Compensate for all losses at replacement costs and provide replacement land within their village or commune satisfactory to them so that their cultural and social cohesion could be maintained. - Support for relocating HHs to restore their livelihood and living conditions. - To be recruited for the subproject. 	Budget for compensation and clearance	During the pre-construction phase	<ul style="list-style-type: none"> - Dong Thap Compensation and Clearance Board - Dong Thap PPMU 	<ul style="list-style-type: none"> - Dong Thap PPMU - IEMC
2	UXO residues		<ul style="list-style-type: none"> - The subproject will allocate fund for clearance of the UXO remained after the war at the construction areas. The subproject owner will sign a contract with the specialized military unit in Dong Thap province to carry out the UXO clearance at the construction sites. This activity will be implemented right after completing land acquisition and compensation and before any dismantling, demolition or ground clearance takes place. - Ensure that the contractors shall 	Subproject budget	After completion of the land acquisition and compensation	<ul style="list-style-type: none"> - UXO clearance contractor 	<ul style="list-style-type: none"> - Dong Thap PPMU - IEMC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementati on time	Implementing agency	Supervising agency
			only commence site works after the subproject areas are already been cleared				

6.2.2. During the construction phase

6.2.2.1. Mitigation measures for general impacts

On the basis of the scale and impacts of the subproject on the natural and socio-economic environment (see Chapter 3) and measures to mitigate these impacts (see Chapter 5), the ESMP) which include ECOP and Codes of Conducts, is designed to manage environmental protection issues in the preparation, construction and operation of the subproject as shown in *Table 6.2* and *Table 6.3*.

Table 6.2: ECOP as mitigation measures of general impacts related to Subproject's activities during the construction phase

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
1	Dust generation/ air pollution	<ul style="list-style-type: none"> - Earthworks and excavation activities will generate dust. - The amount of dust generated from these activities depends on the volume of digging and backfilling, and also depends on the number of machines and trucks working on site. - The construction will be on the river, canal, and in the form of rolling in sequences, which will help to reduce dust generation so air pollution is <i>small</i> - Transportation of materials will small impact because materials will be transported by waterway and will take place at the start of construction and over a very short time 	<ul style="list-style-type: none"> - The Contractor is responsible for compliance with relevant Vietnamese legislation with respect to ambient air quality. - The Contractor shall ensure that the generation of dust is minimized and is not perceived as a nuisance by local residents and shall implement a dust control plan to maintain a safe working environment and minimize disturbances for surrounding residential areas/dwellings. - The Contractor shall implement dust suppression measures (e.g. covering of material stockpiles, etc.) as required. - Material loads shall be suitably covered and secured during transportation to prevent the scattering of soil, sand, materials, or dust. - Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors. - Dust masks should be used by 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			<p>workers where dust levels are excessive</p> <ul style="list-style-type: none"> - All vehicles must comply with Vietnamese regulations controlling allowable emission limits of exhaust gases. - Vehicles in Vietnam must undergo a regular emissions check and obtain certification: "Certificate of conformity from inspection of quality, technical safety and environmental protection" following Decision No. 35/2005/QD-BGTVT. - There should be no burning of waste or construction materials on site. - Cement processing plants should be far from residential areas. 				
2	Impacts from noise and vibration	<ul style="list-style-type: none"> - Operating the construction machines, vehicles will cause the noise, however, most activities will take place in field, so the impact is small. 	<ul style="list-style-type: none"> - The contractor is responsible for compliance with the relevant Vietnamese legislation with respect to noise and vibration. - All vehicles must have appropriate "Certificate of conformity from inspection of quality, technical safety and environmental protection" following Decision No. 35/2005/QDBGTVT, to avoid exceeding noise emission from poorly maintained machines. 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			<ul style="list-style-type: none"> - When needed, measures to reduce noise to acceptable levels must be implemented and could include silencers, mufflers, acoustically dampened panels or placement of noisy machines in acoustically protected areas. - Avoiding or minimizing transportation through community areas and avoiding as well as material processing areas (such as cement mixing). 				
3	Surface water pollution from excavation and filling activities, worker's camp and construction equipment	<ul style="list-style-type: none"> - Wastewater from construction workers is small due to camps is only built at the site of culvert construction. Each camp requires only 1-3 workers to look after the materials so the impact is small. - All construction activities will be in the dry season, so the impact of rainwater runoff is very small. - There are not many construction machines so the amount of discharged oil is small. - The number of boats for material transportation is small (about 1.2 trips a day) but it is dispersed so the impact of material transportation on quality of water is small 	<ul style="list-style-type: none"> - The Contractor must be responsible for compliance with Vietnamese legislation relevant to wastewater discharges into watercourses. - Portable toilets must be provided on sites of culverts; semi-dyke and overflow spillage strengthening; on sucking boat for construction workers. - Discharged oil from construction equipment must be collected and treated as hazardous waste. - Site cleaning limits pollution from runoff 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC
4	Drainage and sedimentation	Lacking control of the temporary material yards in the subproject area may be lead to erosion and	- Control of excavation work from the existing dykes to avoid	Construction cost	During construction	Contractors	- Dong Thap PPMU

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
		sedimentation problems.	spreading the soil to canals - The subproject semi-dykes need to be reinforced before flooding - The subproject dykes that have not been reinforced before floods must be protected by a geotextile. - Build routes of drainage and irrigation for rice farmers when constructing dykes.		phase		- CSC
5	Solid wastes	- Solid waste includes construction solid waste and domestic solid waste. - Construction solid waste includes excavated soil, dredged sludge and cement cover. They will be reused for backfilling and the local authorities have a plan to reuse the remaining solid wastes. These are non-hazardous wastes but it needs to be handled to avoid impacts on air, water qualities, and big dirty masses in the subproject area. - Domestic waste and rubbish (domestic solid waste) generated from workers that contain organic wastes such as rubbish, paper, carton box, etc and other wastes. The average generation volume of the domestic solid waste is about 0.3 kg/person/day. - This domestic waste will be collected to avoid environmental pollution. Due to the volume of this kind of waste is	- At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities. - If possible, excavated soil should be fully utilized for dyke upgrading. - Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc shall be collected and separated on-site from other waste sources for reuse, for use as fill, or for sale. - No burning, on-site burying or dumping of solid waste shall occur. - Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas, such as in areas of natural	Construction cost	During construction phase	Contractors	- Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
		not big, they can be collected into the rubbish collection system along the subproject	habitat or in watercourses.				
6	Hazardous wastes	Hazardous waste is mainly discharged oil, leachate oil, oily rags due to periodic maintenance of equipment. The amount of hazardous wastes is not much, but they could cause adverse impacts to the environment, sanitary, source of diseases on the site. Therefore, it is necessary to collect, transport and treat appropriately.	<ul style="list-style-type: none"> - Chemical waste of any kind shall be disposed of at an approved appropriate landfill site and in accordance with local legislative requirements. The Contractor shall obtain needed disposal certificates. - The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained and certified workers. - Used oil and grease shall be removed from the site and sold to an approved used oil recycling company. - Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and removed from the site by a specialized oil recycling company for disposal at an approved hazardous waste site. - Used oil or oil-contaminated materials that could potentially contain PCBs shall be securely stored to avoid any leakage or 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			<p>affecting workers.</p> <ul style="list-style-type: none"> - Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. - Relevant agencies shall be promptly informed of any accidental spill or incident. - Store chemicals appropriately and with appropriate labeling - Appropriate communication and training programs should be put in place to prepare workers to recognize and respond to workplace chemical hazards - Prepare and initiate a remedial action following any spill or incident. In this case, the contractor shall provide a report explaining the reasons for the spill or incident, remedial action is taken, consequences/damage from the spill, and proposed corrective actions. 				
7	Traffic interruption	The existing dikes are also pathways, so when excavating the existing ones to embank the new dykes will affect the traffic of people.	<ul style="list-style-type: none"> - Before construction, carry out consultations with local government and community and with traffic police. - Significant increases in a number of vehicle trips must be covered in a construction plan previously approved. Routing, especially of 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			<p>heavy vehicles, needs to take into account sensitive sites such as schools, hospitals, and markets.</p> <ul style="list-style-type: none"> - Installation of lighting at night must be done, if necessary, to ensure safe traffic circulation. - Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warnings. - Employ safe traffic control measures, including road/rivers/canal signs and flag persons to warn of dangerous conditions. - Avoid material transportation for construction during rush hours. - Passageways for pedestrians and vehicles within and outside construction areas should be segregated and provide for easy, safe, and appropriate access. Signposts shall be installed appropriately in both water-ways and roads where necessary. - Set up temporary roads at construction sites for people to move 				
8	Worker and public	Workers and local people could be at risk if they travel around or close to	- Contractor shall comply with all Vietnamese regulations regarding	Construction	During construction	Contractors	- Dong Thap

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
	safety	<p>construction sites, or fall to the open holes, buried in the material, etc.</p> <p>Worker concentration will cause the following impacts:</p> <ul style="list-style-type: none"> - Increased demand for infrastructure and utilities. - Pollution caused by waste and domestic wastewater. - Increase the risk of communicable diseases, such as malaria, HIV/AIDS, etc threaten the health of workers and local people. - Affect local social secure, increase crime rate, drug use, prostitution, social conflict, etc. 	<p>worker safety.</p> <ul style="list-style-type: none"> - Prepare and implement an action plan to cope with risk and emergency. - Preparation of emergency aid service at the construction site. - Training workers on occupational safety regulations. - If blasting is to be used, additional mitigation measures and safety precautions must be outlined in the ESMP. - Ensure that earpieces are provided to and used by workers who must use noisy machines such as piling, explosion, mixing, etc., for noise control and workers protection. - The contractor shall provide safety measures such as the installation of fences, barriers warning signs, lighting system against traffic accidents as well as other risk to people. - Contractors' contracts to include conditions to ensure occupational health and safety; do not differentiate payment between women and men, and those who belong to local ethnic Khmer groups, for work of equal value; prevent use of child labor; and 	cost	phase		<p>PPMU</p> <ul style="list-style-type: none"> - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			comply with the government's labor laws and related international treaty obligations.				
9	Traffic safety	All the construction materials will be transported by waterway; accidents can occur due to boats colliding during the travel to the work sites. These incidents can cause serious impacts to the environment, especially to the water quality, such as increasing turbidity by stirring the bed on contact or through oil spills from engine damage	<ul style="list-style-type: none"> - Before construction, carry out consultations with local government and community and with traffic police. - Significant increases in a number of vehicle trips must be covered in a construction plan previously approved. Routing, especially of heavy vehicles, needs to take into account sensitive sites such as schools, hospitals, and markets. - Installation of lighting at night must be done, if necessary, to ensure safe traffic circulation. - Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warnings. - Employ safe traffic control measures, including road/rivers/canal signs and flag persons to warn of dangerous conditions. - Avoid material transportation for construction during rush hours. - Passageways for pedestrians and vehicles within and outside 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			construction areas should be segregated and provide for easy, safe, and appropriate access. Signposts shall be installed appropriately in both water-ways and roads where necessary.				
10	Communication with local communities	Lack of communication and consultation with local communities can lead to opposition to the subproject delays in the construction process, increased costs and unsatisfactory solutions.	<ul style="list-style-type: none"> - Maintain open communications with the local government and concerned communities; the contractor shall coordinate with local authorities (leaders of local wards or communes, leader of villages) for agreed schedules of construction activities at areas nearby sensitive places or at sensitive times (e.g., religious festival days). - Copies in Vietnamese of these ECOPs and of other relevant environmental safeguard documents shall be made available to local communities and to workers at the site. - Reduced playground space, loss of playing fields and car parking: The loss of amenities during the construction process is often an unavoidable source of inconvenience to users in sensitive areas. However, early consultation with those affected provides the opportunity to 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			<p>investigate and implement alternatives.</p> <ul style="list-style-type: none"> - Disseminate subproject information to affected parties (for example local authority, enterprises and affected households, etc) through community meetings before construction commencement, focusing on female-headed households, poor and vulnerable populations. - Provide a community relations contact from who interested parties can receive information on site activities, subproject status and subproject implementation results. - Provide all information, especially technical findings, in a language that is understandable to the general public and in a form useful to interested citizens and elected officials through the preparation of fact sheets and news releases, when major findings become available during the subproject phase. - Monitor community concerns and information requirements as the subproject progresses. - Respond to telephone inquiries 				

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			and written correspondence in a timely and accurate manner.				
11	Chance find procedures	<ul style="list-style-type: none"> - There are also no important historical and cultural sites identified in the subproject construction sites. There are schools, residential areas near the construction sites but impacts on the temples are likely small and to mitigate potential noise impacts, equipment with low noise signatures will be used, work activities will avoid days of worship, and if necessary, noise barriers will be installed. - No adverse impacts on other historical and cultural heritage features are expected during the construction phase of the subproject 	<p>If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:</p> <ul style="list-style-type: none"> - Stop the construction activities in the area of the chance find. - Delineate the discovered site or area. - Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Culture, Sports and Tourism take over. - Notify the Construction Supervision Consultant who in turn will notify responsible local or national authorities in charge of the Cultural Property of Viet Nam (within 24 hours or less). - Relevant local or national authorities are in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This will require a preliminary evaluation 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			<p>of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; including the aesthetic, historic, scientific or research, social and economic values.</p> <ul style="list-style-type: none"> - Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage. - If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relic's authority, the Subproject's owner will need to make necessary design changes to accommodate the request and preserve the site. - Decisions concerning the management of the finding shall be communicated in writing by relevant authorities. - Construction works could resume only after permission is granted 				

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
			from the responsible local authorities concerning safeguard of the heritage.				
12	Fire and an explosive incident during the construction phase	Fire and explosion incidents could occur during transporting and storing fuel, or because of unsafe use of the temporary electric generation system, causing loss of life and property during construction.	<ul style="list-style-type: none"> - Provide equipment and procedures for fire prevention and control on site; - Apply fire and explosion prevention and management standards on site and at fuel storage areas; - Equipping fire prevention and fighting equipment on site and training workers on fire prevention and management. - Provide protective equipment for workers; 	Construction cost	During construction phase	Contractors	<ul style="list-style-type: none"> - Dong Thap PPMU - CSC

Table 6.3: Workers Codes of Conducts

<p>Workers Codes of Conducts</p> <ol style="list-style-type: none"> 1. Compliance with applicable laws, rules, and regulations, with applicable health and safety requirements; 2. Prioritise the use of local labours, particularly ethnic minorities 3. The transportation, storage and use of illegal substances including weapons is prohibited; 4. Do not involve in social evils. Do not quarrel or fight that cause social disorder 5. Do not catch, hunt, trade, keep in cage or usage of wildlife or wildlife products. Do not bring domestic animals in camps 6. Do not use alcohol during working hours, smoking at construction site is prohibited; 7. Non-Discrimination (for example on the basis of family status, ethnicity, race, gender, religion, language, marital status, birth, age, disability, or political conviction) 8. Interactions with community members with attitude of respect and non-discrimination) 9. Sexual harassment (for example to prohibit use of language or behavior, in particular towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate) is prohibited 10. Violence or exploitation (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior) is prohibited 11. Protection of children (including prohibitions against abuse, defilement, or otherwise unacceptable behavior with children, limiting interactions with children, and ensuring their safety in project areas) 12. Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection) 13. Respecting reasonable work instructions (including regarding environmental and social norms) 14. Protection and proper use of property. Maintain sanitation and safe conditions in both camps and construction sites. Prohibit theft, careless usage of resources, set fire without being authorised or pollute the environment 15. Duty to report violations of this Code <p>Violations of the Codes of conducts will lead to disciplinary actions</p>

6.2.2.2. Mitigation measures for specific impacts

Table 6.4 presents site-specific mitigation measures that could not be addressed through the application of the ECOPs because the site-specific mitigation measures are for addressing the impacts which are very site-specific.

Table 6.4: Mitigation measures for specific impacts of structure works

Structure works/construction activities	Specific impacts	Mitigation measures
Canal dredging	<ul style="list-style-type: none"> - Increased turbidity reduces water quality, affecting aquaculture, especially shrimp farming area (Cu Lao Chim), catfish farming (Khang Chien canal section close to Vinh Hung - Hong Ngu canal). - Risk of erosion due to dredging activities. - Impacts and risks at disposal sites - Impacts of dredged sludge with acid sulfate soil (pH 5-6). - Impact on navigation 	<ul style="list-style-type: none"> - Preparing the dredged material disposal plan (DMDP) for dredging, details are in Appendix 7. - Installation of lighting at night must be done if this is necessary to ensure safe traffic circulation. - Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. - Employing safe traffic control measures, including canal signs and flag persons to warn of dangerous conditions. - When dredging below wooden and iron bridges with clearance elevations lower than the height of the dredger, the constructor must temporarily remove these bridges and inform alternative bridges for local people a week before dredging. In case there have no alternative bridges, the constructor must install temporary bridges for local people movement. - Inform alternative roads for local people a week before dredging where the pipelines of the suction dredger across over the roads. - Operate dredging bucket in accordance with the process and speed to limit disperse of sediment when collecting bucket too fast. - Perform water quality monitoring parameters such as SS, pH, turbidity during construction. - Tug boats, barges transporting sediment into dump sites will be covered to prevent odors into the surrounding environment during transport. Sediment should be transported within the permitted capacity of barges to avoid leakage into canals on the way. This measure will reduce odor to the environment about 40-70% if without covering during the transport. - Do not pump the sediment into the dump sites at night, if there are complainants about foul odor from the dump sites, the construction teams must consider stopping the construction to take appropriate measures.

Structure works/construction activities	Specific impacts	Mitigation measures
		<ul style="list-style-type: none"> - In order to minimize impacts from dredging activities to aquaculture water-taking by users, when preparing the construction, the construction companies should coordinate with local people to inform the construction plan, construction time and time to stop construction on the local media to the aquaculture farmers to plan to take water before the construction time or not when the water sources are affected by dredging. - Arrange appropriate construction time. In case of people's aquaculture in the radius of 1-2km who need water for aquaculture, do not dredge at the peak tide. - Prior to pumping dredged sediment into dump sites, the Subproject Owner will notify the local authorities about the dredging plan. - The results of sediment analysis show that the metal concentration in the river sediment meets the environmental standard which can be used for planting and leveling after dewatering. - The Subproject Owner requires the Contractors in charge of dredging to regularly inspect dump sites, dredged sediment, especially after heavy rainfall to consider damages caused by the flow, soil erosion or deposit. Simultaneously, restore the premises before completing the works. - The Subproject Owner requests the Contractors to keep sediment and spoil management records including the amount of sediment, dredged soil and reused quantity, composition and properties of the sediment, how to treat, names and addresses of sediment receiving sites where sediment is used. - A dumpsite must have at least 2 compartments (sediment compartment and settling compartment) to increase the retaining time in the site. Wastewater must be stored in the compartment for at least one day to let small sediment settle. - At the discharge sluice gates, bamboo and sand-bags will be strengthened to avoid water discharge to cause a landslide. - The embankment should be higher than the design 20cm and the safety coefficient is 1.1 to avoid when pumping sediment out, it is overflow when it

Structure works/construction activities	Specific impacts	Mitigation measures
		<p>is filled. The pumping process starts from a distance far from the sluice gate and connects pipes gradually to the sluice gate to ensure the maximum retention time of water in a dumpsite.</p> <ul style="list-style-type: none"> - Monitor water source from a dump site sluice gate to not pollute the surface water environment. If the water quality does not meet the standard, the construction teams must stop pumping and wait for the SS settling to not exceed the allowed standard. - Regularly monitor maintenance and inspection of dyke embankments daily and check seepage. To ensure safety when operating the sluice gates, the construction teams arrange at least 20 soil-bags at a sluice gate. - Set up barriers and signboards that prohibit people, especially children, from entering the dump sites. - In case of sediment and water spillage from the dump sites to the environment, the construction teams shall take measures to stop the incidents and work with local authorities to compensate for damages. - Temporary stop all dredging works in case of heavy rain or any emergency. - Minimize effects the trees on both sides of the canal, which may be home to birds - Do not catch, hunt birds <p>Erosion along the dredging routes:</p> <ul style="list-style-type: none"> - Monitoring bank erosion during dredging. - Sending staff to observe daily erosion during the construction phase. - Construction of the slope in accordance with the design to ensure the stability of the flow. - Construction of the route has been determined, avoid construction on one side. - During the construction process, if there is phenomena or risk erosion, the construction companies should suspend the construction and report the Subproject Owner and the specialized units to survey the impact and take

Structure works/construction activities	Specific impacts	Mitigation measures
		appropriate measures.
Strengthening semi-embankment and spillways	<ul style="list-style-type: none"> - Impact on people's traffic in some residential clusters, lines such as Kho Be RC, Khang Chien RL and An Binh B RL, - Impacts due to dust, noise, vibration on people in some residential clusters such as Kho Be RC, Khang Chien RL and An Binh B RL - Risk of a landslide by construction activities 	<ul style="list-style-type: none"> - Install signboards, construction instructions, provide alternative directions for people moving. - In the absence of alternative roads, organize the construction of one half of the route to maintain the passage for people to go back and forth. - Notify the people about the construction activities and the impacts caused by the construction such as dust and noise before construction 1 month. - Do not burn waste at the site. - Spray water to prevent dust on sunny and windy days. - Resolve immediately the problem caused by construction to local people. - The transportation of raw materials and construction equipment when going through the school must go at a speed of 5 km/h - Construction activities should be in daytime
Building culverts, sluices and pump stations	<ul style="list-style-type: none"> - Impacts due to dust, noise, vibration on people around - Risk of landslide due to construction 	<ul style="list-style-type: none"> - Notify the people about the construction activities and the impacts caused by the construction such as dust and noise before construction 1 month. - Do not burn waste at the site. - Spray water to prevent dust on sunny and windy days. - Resolve immediately the problem caused by construction to local people - Construction activities should be in daytime

Structure works/construction activities	Specific impacts	Mitigation measures
	activities - Impacts of installation of 18,400m medium voltage line - Disruption of irrigation services due to the process of construction and existing production of local people occurs in parallel	- Provide alternative pumps for irrigation and drainage activities during activities

Table 6.5: Mitigation measures for site-specific impacts

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
I	Dredging canal			
1	Khang Chien canal from Tan Thanh – Lo gach to An Phong – My Hoa			
1.1	From km 4+800 to Km 8+600	Kho Be residential route is about 700m long	- Increased construction wastes, waste, water, exhaust gases, dust and noise affecting local people' health - Traffic disruption where the pipelines of suction dredger cross over the road to the disposal site - Traffic disruption where the bridge having clearance elevation lower than the height of	- It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
			<p>the suction dredger</p> <ul style="list-style-type: none"> - Impact on aquaculture due to high turbidity - Traffic safety risks to the community, especially at night - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission 	<p>water sources by pollution.</p> <ul style="list-style-type: none"> - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction worker - Constructor must temporarily remove these bridges and inform alternative bridges for local people a week before dredging. In case there have no alternative bridges, the constructor must install temporary bridges for local people movement. - Inform alternative roads for local people a week before dredging where the pipelines of the suction dredger across over the roads.
1.2	From Km 12+400 to Km 20+600	Ca No RA with the length of 250m	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting local people' health - Traffic disruption where the pipelines of suction dredger cross over the road to the disposal site - Traffic disruption where the bridge having clearance elevation lower than the height of the suction dredger - Impact on aquaculture due to high turbidity - Traffic safety risks to the community, especially at night - Increase in criminal activity and alcohol and drug abuse, domestic violence, 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc.) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction workers

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
			prostitution, smuggling and gang activity, gender-based violence and diseases transmission	
		Phu Thanh B Primary and Secondary School	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Lessons affected by noise and vibration 	<ul style="list-style-type: none"> - Inform the schools about the construction plan and the impacts caused by the construction to the schools such as dust and noise a month before the construction. - Do not burn waste at the site. - Spray water to prevent dust on sunny and windy days. - Resolve immediately the problem caused by the construction to the schools. - The means of transporting construction materials, equipment when going through the school must go at a speed of 15km/h - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge - Ensure noise from construction site to school is 55dBA in daytime. - Training on the code of conducts for construction workers
		Phu Thanh A ferry	<ul style="list-style-type: none"> - Risk on the safety of local people 	<ul style="list-style-type: none"> - Arrange traffic regulators at the construction site. - Install signboards - Training on the code of conducts for construction workers

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
1.3	Km 25+00 to Km 30+300	Khang Chien RL with the length of 1km	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting local people' health - Traffic disruption where the pipelines of suction dredger cross over the road to the disposal site - Traffic disruption where the bridge having clearance elevation lower than the height of the suction dredger - Impact on aquaculture due to high turbidity - Traffic safety risks to the community, especially at night - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction worker
		50m from the construction site	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting patients' health - Conflicts between construction workers and patients and their families 	<ul style="list-style-type: none"> - Arrange traffic regulators at the construction site - Do not work at night - Ensure the noise level from the construction site to the medical station is 55dBA during daytime. - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge. - Spray water to prevent dust on sunny and windy days. - Training on the code of conducts for construction workers

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
		50m from the construction site	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Lessons affected by noise and vibration 	<ul style="list-style-type: none"> - Inform the schools about the construction plan and the impacts caused by the construction to the schools such as dust and noise a month before the construction. - Do not burn waste at the site. - Spray water to prevent dust on sunny and windy days. - Resolve immediately the problem caused by the construction to the schools. - The means of transporting construction materials, equipment when going through the school must go at a speed of 15km/h - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge - Ensure noise from construction site to school is 55dBA in daytime. - Training on the code of conducts for construction workers
II	Sluices and pumping stations			
2.1	Muong Vop pump station	The RL of Thuong Thoi Hau A commune, Hong Ngu town	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc.) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. -

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
			<ul style="list-style-type: none"> - Impact on waterway transportation 	<ul style="list-style-type: none"> - Good drainage to avoid storm water run-off to orchard land of local people - Training on the code of conducts for construction worker - Inform construction plan 1 month in advance for people to be active in their living activities and production
2.2	Chin Hue pump station, Dau Ca Cat culvert and pump station, Nam Mung culvert	The RL of Thuong Thoi Hau B commune, Hong Ngu town	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation - Impact on taking water for production - Increase the risk of incidents 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc.) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid storm water run-off to orchard land of local people - Training on the code of conducts for construction worker - Inform construction plan 1 month in advance for people to be active in their living activities and production
2.3	Kho Be culvert	Kho Be RL, Hong Ngu	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster.

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
		town	<ul style="list-style-type: none"> - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation - Impact on taking water for production - Increase the risk of incidents 	<ul style="list-style-type: none"> - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc.) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid storm water run-off to orchard land of local people - Training on the code of conducts for construction worker - Inform construction plan 1 month in advance for people to be active in their living activities and production
2.4	Bay Muoi Hai culvert and pump station	The residential route of An Binh B commune, Hong Ngu town	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting people' health - Vibration caused by the construction machinery may affect houses - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, gender-based violence and diseases transmission - Impact on waterway transportation - Impact on taking water for production - Increase the risk of incidents 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid storm water run-off to orchard land of local people - Training on the code of conducts for construction workers - Inform construction plan 1 month in advance for people to be active in their living activities and production

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
2.5	Ong Nhon culvert and pump station	Pangasius pond	Fish death due to water pollution	<ul style="list-style-type: none"> - Wastewater, solid waste, spoil should be controlled to avoid effect on surface water sources by pollution. - Training on the code of conducts for construction workers
2.6	Culvert and pump station at the west side of Khang Chien	Shrimp ponds	Shrimp death due to water pollution	<ul style="list-style-type: none"> - Wastewater, solid waste, spoil should be controlled to avoid effect on surface water sources by pollution. - Training on the code of conducts for construction workers
2.7	Phu Thanh B culvert and pump station	Tram Chim National Park, 70m far from the station	<ul style="list-style-type: none"> - Air emission, waste generation and vibration caused by the construction - Illegal entry of construction workers to cut trees and shoot birds 	<ul style="list-style-type: none"> - Strictly forbidden to dispose of domestic and construction wastes into water sources - Strictly forbidden to hunt animals in the forest - Do not burn waste at the site

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
				<ul style="list-style-type: none"> - Ensure noise from the construction site to the NP is 55dBA in daytime. - Do not build at night. - Training on the code of conducts for construction workers
2.8	Ho Dau pump station	Phu Loi Secondary School, 50m far from the station	<ul style="list-style-type: none"> - Increased construction wastes, waste, water, exhaust gases, dust and noise affecting students' health - Lessons affected by noise and vibration - Risks of traffic and works accidents to teachers and students - Vibration caused by the construction machinery may affect wall, the gate of school 	<ul style="list-style-type: none"> - Inform the schools about the construction plan and the impacts caused by the construction to the schools such as dust and noise a month before the construction. - Do not burn waste at the site. - Spray water to prevent dust on sunny and windy days. - Resolve immediately the problem caused by the construction to the schools. - The means of transporting construction materials, equipment when going through the school must go at a speed of 15km/h - Do not let the dredging sludge flow over the road, spray the deodorant of the sludge - Ensure noise from construction site to school is 55dBA in daytime. - Training on the code of conducts for construction workers
III	Embankment and spillways			

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
<i>1</i>	<i>Spillways</i>			
1.1	Ca Sach, Coi Dai and Coi Tieu spillways	Reinforcing head of Ca Sach canal, near the RA of Thuong Thoi Hau A, Hong Ngu district	<ul style="list-style-type: none"> - Impacts due to air emission, noise and vibration - Vibration caused by the construction machinery may affect houses - Potential localized flooding caused construction during rainy days - Risks of traffic and accidents - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc.) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid storm water run-off to orchard land of local people - Training on the code of conducts for construction worker
1.2	Ca Cat, Nam Mung culverts and pump stations	Residential route of Thuong	<ul style="list-style-type: none"> - Impacts due to air emission, noise and vibration - Vibration caused by the construction 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster.

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
		Thoi Hau B	<p>machinery may affect houses</p> <ul style="list-style-type: none"> - Potential localized flooding caused construction during rainy days - Risks of traffic and accidents - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission 	<ul style="list-style-type: none"> - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction workers
1.3	Hai Thang Chin canal	Hai Thang Chin RA	<ul style="list-style-type: none"> - Impacts due to air emission, noise and vibration - Vibration caused by the construction machinery may affect houses - Potential localized flooding caused construction during rainy days - Risks of traffic and accidents - Increase in criminal activity and alcohol 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
			and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission	water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction workers
1.4	Thong Nhat canal	Thong Nhat RA	- Impacts due to air emission, noise and vibration - Vibration caused by the construction machinery may affect houses - Potential localized flooding caused construction during rainy days - Risks of traffic and accidents - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission	- It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction worker
2	<i>Embankment</i>			
2.1	West bank of Khang Chien	Kho Be residential cluster	- Impacts due to air emission, noise and vibration - Vibration caused by the construction machinery may affect houses	- It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
			<ul style="list-style-type: none"> - Potential localized flooding caused construction during rainy days - Risks of traffic and accidents - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission 	<ul style="list-style-type: none"> and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction worker
2.2	East bank of Khang Chien canal (from Hong Ngu – Tam Nong to Thanh Binh – Tam Nong)	Ca No RA	<ul style="list-style-type: none"> - Impacts due to air emission, noise and vibration - Vibration caused by the construction machinery may affect houses - Potential localized flooding caused construction during rainy days - Risks of traffic and accidents - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission 	<ul style="list-style-type: none"> - It shouldbe paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc) around the construction area. - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction worker
2.3	East bank of Khang Chien canal (from Duong Gao canal to Tam Nong border canal)	Khang Chien RL, Phu Loi commune	<ul style="list-style-type: none"> - Impacts due to air emission, noise and vibration - Vibration caused by the construction machinery may affect houses - Potential localized flooding caused 	<ul style="list-style-type: none"> - It should be paying attention to prevent dust, noise when construction is a nearby residential cluster. - Ensure traffic safety (installation of fence and warning sign, traffic instruction, etc)

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
			<p>construction during rainy days</p> <ul style="list-style-type: none"> - Risks of traffic and accidents - Increase in criminal activity and alcohol and drug abuse, domestic violence, prostitution, smuggling and gang activity, - Increase in gender-based violence - Increases diseases transmission 	<p>around the construction area.</p> <ul style="list-style-type: none"> - Wastewater, solid waste, spoil, etc. should be controlled to avoid an effect on surface water sources by pollution. - Good drainage to avoid stormwater run-off to orchard land of local people - Training on the code of conducts for construction worker
IV	Disposal Sites			
1	Site No. 3a, 3b, 3c	The dump site makes use of the earth pond that has been exploited to fill the Kho Be residential area in 2 communes of An Binh A and An Binh B, Hong Ngu	<ul style="list-style-type: none"> - Risks on local people falling to the disposal sites - Risks on local flooding due to the breaking of the embankments of the disposal sites and heavy rains 	<ul style="list-style-type: none"> - Set up barriers and signboards that prohibit people, especially children, from entering the dump sites. - Training on the code of conducts for construction workers - At the outlets, bamboo and sand-bags will be strengthened to avoid water discharge to cause a landslide. - The embankment should be higher than the design 20cm and the safety coefficient is 1.1 to avoid when pumping sediment out, it is overflow when it is filled. The pumping process starts from a distance far from the sluice gate and connects pipes gradually to the sluice gate to ensure the maximum retention time of water in a

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
		Town so it is located just behind Kho Be RA		<p>dumpsite.</p> <ul style="list-style-type: none"> - Regularly monitor maintenance and inspection of embankments of disposal sites daily and check seepage. To ensure safety when operating the outlets, the construction teams arrange at least 20 soil-bags at an outlet. - In case of sediment and water spillage from the dump sites to the environment, the construction teams shall take measures to stop the incidents and work with local authorities to compensate for damages.
2	Site No. 5	The dump site makes use of the earth pond that has been exploited to fill the Khang Chien RA in Phu Loi commune so it is located just behind Khang Chien RA	<ul style="list-style-type: none"> - Risks on local people falling to the disposal sites - Risks on local flooding due to the breaking of the embankments of the disposal sites and heavy rains 	<ul style="list-style-type: none"> - Set up barriers and signboards that prohibit people, especially children, from entering the dump sites. - Training on the code of conducts for construction workers - At the outlets, bamboo and sand-bags will be strengthened to avoid water discharge to cause a landslide. - The embankment should be higher than the design 20cm and the safety coefficient is 1.1 to avoid when pumping sediment out, it is overflow when it is filled. The pumping process starts from a distance far from the sluice gate and connects pipes gradually to the sluice gate to ensure the maximum retention time of water in a dumpsite. - Regularly monitor maintenance and

No.	Work Item/Location and photos/map	Noticeable Features	Site-Specific Impacts/Risks	Mitigation measures
				<p>inspection of embankments of disposal sites daily and check seepage. To ensure safety when operating the outlets, the construction teams arrange at least 20 soil-bags at an outlet.</p> <ul style="list-style-type: none"> - In case of sediment and water spillage from the dump sites to the environment, the construction teams shall take measures to stop the incidents and work with local authorities to compensate for damages.

6.2.3. During the operation phase

Mitigation measures during the operation phase are summarized in *Table 6.6*.

Table 6.6: Mitigation measures during the operation phase

No.	Subproject activities	Environmental and social impacts	Mitigation measures	Budget	Implementation time	Implementing agency	Supervising agency
1.	Structure works						
	Operation of structure works	<ul style="list-style-type: none"> - Damage of culverts, sluices - Damage of semi-embankment landslide, and sedimentation - Traffic accidents on the embankment - Explosion and fire of electric pump station 	<ul style="list-style-type: none"> - Contractors must comply with the technical standards as designed and have independent units that monitor the quality of the works. - The irrigation management agency together with the local authorities and people regularly check and maintain the works every year to ensure the stable embankment as well as the system of culverts, sluices and pumping stations. - The separation of water sources must be carried out for the aquaculture model of two rice production models at the beginning and the end of the flood season - Installing signs, safety instructions to minimize the potential for increased traffic accident accidents 	Operation budget	During the operation phase	<ul style="list-style-type: none"> - Local government and traffic authorities - DPCs of subproject districts 	Dong Thap PPC
2	Non-structure works						
2.1	Operation of livelihood models	<ul style="list-style-type: none"> - Waste generation - Increase agriculture chemicals - Abnormal weather conditions affect the models - Risk of disease 	<ul style="list-style-type: none"> - Technical training for farmers on livelihood model production - Collect and treat wastes from the models - Development of brand and trade 	Local budget	During the operation phase	Authorities of Hong Ngu district, Hong Ngu town, Tam Nong district, Thanh	Dong Thap PPC

		<ul style="list-style-type: none"> - Risk of market - Social issues 	<ul style="list-style-type: none"> for products - Do not use drugs prohibited under Circular No. 08/VBHN-BNNPTNT - Training IPM and “1 must 5 reductions” programs to limit the use of pesticides - Livelihood support for the landless in the subproject areas should be established or extended from existing development programs - Encourage agribusiness (particularly vertically integrated companies) companies to extend their value chains to create employment opportunities for the poor - Extension training programs should ensure that they are done in a manner and time that allows women to adequately tend to their domestic duties, ie. childcare, meal preparations, etc. 			Binh district, Dong Thap province	
2.2	Expansion livelihood models	Land use change due to the conversion of rice land into aquaculture or other cash crops	<ul style="list-style-type: none"> - Determine clearly zone, area and purpose of land use toward rice crop production together with giant freshwater shrimp (Model No. 1). - Determine clearly the region, area and purpose of land use toward vegetation crop production together with floating rice crop production in combination with 	Local budget	During the operation phase	<ul style="list-style-type: none"> - Authorities of Hong Ngu district, Hong Ngu town, Tam Nong district, Thanh Binh district, Dong Thap province 	Dong Thap PPC

			<p>the exploitation of aquaculture (Model No. 2).</p> <ul style="list-style-type: none"> - Determine clearly the region, area and purpose of land use toward 2 crops. - The local government/ authority needs to manage the adjusted land use purpose planning to manage the production activities to be suitable with the plan as well as the production scale which is proposed in the subproject. - Based on the result of the demonstration model, the actual need and demand as well as the capability of expansion of the market, especially the production demand of the local residential people, then the local government/ authority will propose to the project owner to have the orientation to maintain or continue expansion of the suitable production model with the water resource condition and the infrastructure condition. 				
2.3	Expansion livelihood models	Land use change due to the conversion of rice land into aquaculture or other cash crops.	<ul style="list-style-type: none"> - Determine clearly zone, area and purpose of land use toward rice crop production together with giant freshwater shrimp (Model No. 1). - Determine clearly the region, area and purpose of land use toward vegetation crop production 	Local budget	During the operation phase	<ul style="list-style-type: none"> - Authorities of Hong Ngu district, Hong Ngu town, Tam Nong district, Thanh Binh district, Dong Thap 	Dong Thap PPC

			<p>together with floating rice crop production in combination with the exploitation of aquaculture (Model No. 2).</p> <ul style="list-style-type: none"> - Determine clearly the region, area and purpose of land use toward 2 crops. - The local government/ authority needs to manage the adjusted land use purpose planning to manage the production activities to be suitable with the plan as well as the production scale which is proposed in the subproject. - Based on the result of the demonstration model, the actual need and demand as well as the capability of expansion of the market, especially the production demand of the local residential people, then the local government/ authority will propose to the project owner to have the orientation to maintain or continue expansion of the suitable production model with the water resource condition and the infrastructure condition. 			province	
2.4	Expansion livelihood models	Develop a large group of products while not reach the output.	<ul style="list-style-type: none"> - Market forecast for the subproject output such as shrimp, organic rice, floating rice without using pesticides for production. - Branding for shrimp, clean rice, floating rice, organic rice. 	Local budget	During the operation phase	- Dong Thap PPC, DONRE and DOIT	Dong Thap PPC

			- Find a stable output for the shrimp, floating rice, organic rice, clean rice through trade promotion products.				
2.5	Expansion livelihood models	The farmers have not mastered techniques of shrimp farming, floating rice production, so when applied cannot successfully reduce the spread of the models on a large scale.	Technical training for farmers on livelihood model production	Local budget	During the operation phase	- Dong Thap Department of Aquaculture - Agriculture and Fishery Extension Center	Dong Thap PPC
2.6	Expansion livelihood models	Water use conflicts could happen if the embankment for production compartments of models production will be built, especially for the model 1 and model 2	- Planning the production areas which is similar water resource condition	Local budget	During the operation phase	- Authorities of Hong Ngu district, Hong Ngu town, Tam Nong district, Thanh Binh district	Dong Thap PPC
2.7	Expansion livelihood models	- Farmers raise shrimp on an industrial scale, the risk of environmental damage will be very large. - Solid waste from feedstuff packaging	- Shrimp culture should not be developed on an industrial scale but should be raised on an extensive scale (maximum density from 3-5 heads /m ²). - Solid waste from shrimp farming should be collected and treated - Do not use drugs prohibited under Circular No. 08/VBHN-BNNPTNT - Not develop shrimp industrial shrimp farming in the area	Local budget	During the operation phase	- Dong Thap Department of Aquaculture - Agriculture and Fishery Extension Center - Authorities of Hong Ngu district, Hong Ngu town, Tam Nong district, Thanh Binh district	Dong Thap PPC
	Expansion	- Local people still use pesticides as the	- Training IPM and “1 must 5	Local budget	During the	- Dong Thap	Dong Thap

	livelihood models	current situation in rice production	<p>reductions” programs to limit the use of pesticides</p> <ul style="list-style-type: none"> - Do not use drugs prohibited under Circular No. 08/VBHN-BNNPTNT 		operation phase	<p>Department of Aquaculture</p> <ul style="list-style-type: none"> - Agriculture and Fishery Extension Center - Authorities of Hong Ngu district, Hong Ngu town, Tam Nong district, Thanh Binh district 	PPC
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6.3. ENVIRONMENTAL QUALITY MONITORING

6.3.1. Monitoring of Contractor's Safeguard Performance

Three levels of safeguard monitoring will be implemented: routine monitoring, periodic monitoring, and community monitoring, as follows:

- Routine monitoring: The routine monitoring will be made by the Construction Supervision Consultant (CSC) assigned by Dong Thap PPMU. The CSC will include the monitoring results in the subproject progress reports. TOR of the CSC for the subproject is in *Appendix 8*.
- Periodic monitoring (every six months): As part of the overall monitoring of the ESMP, the ESU assisted by the Independent Environmental Monitoring Consultant (IEMC) will also monitor the contractor performance every 6 months and the results will be reported to the Dong Thap PPMU and the WB. TOR of the IEMC for the subproject is in *Appendix 9*.
- Community monitoring: as discussed in subsection 6.5 and GRM, local communities have rights to monitor the Government practices with the technical and management support from the Dong Thap PPMU. If unexpected problems are found, they can report to CSC or the Dong Thap PPMU.

6.3.2. Environmental Quality Monitoring

The contents of the environmental quality monitoring include monitoring of air environment, noise level, water environment, water quality, sediment during construction. This work will be directly carried out by contractors, the subproject owner will supervise the environmental monitoring of the contractors and report the monitoring results to Dong Thap DONRE. During subproject operation, quality of water, soil and sediment will be monitored. This work will be coordinated with the Office of Natural Resources and Environment of districts of Hong Ngu, Tam Nong and Thanh Binh and Hong Ngu town and report the results to the Dong Thap DONRE. Details are in *Table 6.7*.

Table 6.7: Environmental quality monitoring of the subproject

No	Contents	Specific requirements
I	Construction phase	
1	Air/noise, vibration	
a	Parameters	TSP, NO ₂ , SO ₂ , CO, noise, vibration
b	Locations	5 locations at construction sites of culverts, and dike strengthening, flood overflows
c	Frequency	03 months/time during the construction phase
d	Applied standard	QCVN 05:2013/BTNMT, QCVN 26:2010/BTNMT; QCVN 27:2010/BTNMT
2	Water + micro organism + aquatic life	
a	Parameters	Turbidity, pH, DO, TSS, BOD ₅ , oil and grease, Coliform, phytoplankton, zooplankton, zoobenthos
b	Locations	10 locations at the construction sites of canal

No	Contents	Specific requirements
		dredging, big culverts and sludge disposal sites
c	Frequency	03 months/time during the construction phase
d	Applied standard	QCVN 08-MT:2015/BTNMT
3	Soil and sediment	
a	Parameters	pH, Cu, Pb, Zn, Cd, As, salinity, oil and grease
b	Locations	5 locations at the sites of big sluices and sludge disposal sites
c	Frequency	03 months/time during the construction phase
d	Applied standard	QCVN 03-MT:2015/BTNMT; QCVN 43:2012/BTNMT;
II	Operation phase	
1	Water quality	
a	Parameters	Turbidity, pH, DO, TSS, BOD ₅ , Coliform, phytoplankton, zooplankton, zoobenthos
b	Locations	10 locations in the areas of livelihood model are likely to generate wastes
c	Frequency	03 months/time during the first 2 years of operation
d	Applied standard	QCVN 08-MT:2015/BTNMT
2	Soil and sediment	
a	Parameters	pH, Cu, Pb, Zn, Cd, As
b	Locations	05 locations in the areas of livelihood model are likely to generate wastes
c	Frequency	03 months/time during the first 2 years of operation
d	Applied standard	QCVN 03-MT:2015/BTNMT; QCVN 43:2012/BTNMT;
3	Erosion monitoring	
a	Locations	10 positions, in which: 7 of the canal head construction of spillways and 3 of big sluices
b	Frequency	06 months/time during the first 2 years of operation

Table 6.8: Cost of environmental quality monitoring

TT	Activities	Unit	Quantity	Unit price (VND)	Total (VND)
I	Construction phase				504,160,000
1	Total of sampling (48 months x 3 months/time = 16 times)	Time	16		
2	Air/noise (5 samples x 16 times)	Sample	80	654,000	52,320,000
3	Water + micro organism + aquatic life (12 samples x 16 times)	Sample	160	2,177,000	348,320,000
4	Soil and sediment (5 samples x 16 times)	Sample	80	1,294,000	103,520,000
II	Operation phase (during the first 2				225,920,000

TT	Activities	Unit	Quantity	Unit price (VND)	Total (VND)
	years of operation)				
1	Total of sampling (24 months x 3 months/time = 8 times)	Time	8		
2	Water + micro organism + aquatic life (10samples x 8 times)	Sample	80	2,177,000	174,160,000
3	Soil and sediment (5 samples x 8 times)	Sample	40	1,294,000	51,760,000
4	Erosion monitoring (10 site x 4 times)	Time			
	TOTAL = I+II				730,080,000

*Figure 6.1: Environmental monitoring sites during the construction phase
(Note: N: Surface water; T: Soil/Sediment; K: Air)*

Figure 6.2: Environmental monitoring sites during the operation phase

(Note: N: Surface water; T: Soil/Sediment)

6.3.3. Community-based monitoring

Community-based monitoring is a voluntary activity of people living in commune/ ward areas. Community Supervision Board will be established by Decision No. 80/2005/QĐ-TTg and other relevant regulations. Community Supervision Board will be responsible for:

- Monitoring and assessing the observance of investment management regulations by agencies competent to decide on investment, investors, project management unit, contractors and project-implementing units in the investment process (including environmental issues);
- Detecting and recommending to the competent state agencies on violations of regulations on investment management (including environmental issues) so as to promptly prevent and handle acts that violate regulations, cause wastage and/or loss of state capital and properties or infringe the interests of the community.

6.3.4. Monitoring Effectiveness of the ESMP

The ESU assisted by IEMC will monitor performance of the ESMP implementation during the detailed design/bidding stage as well as during construction and first-year operation of the facilities to ensure that (a) appropriate dredging and disposal of drainage sludge is properly carried out, in accordance with the DMMP; (b) other impacts identified in the ESMP are effectively managed and mitigated; and (c) traffic management is adequate and the level of impacts is acceptable (no complaints or outstanding cases). Results are to be properly kept in

the subproject file for possible review by PPMU Dong Thap and the WB. Cost for the monitoring will be part of the PPMU Dong Thap cost.

6.4. ROLE AND RESPONSIBILITIES FOR ESMP IMPLEMENTATION

6.4.1. Implementation arrangement

Role and responsibilities for ESMP implementation are described in *Figure 6.3* and *Table 6.9*.

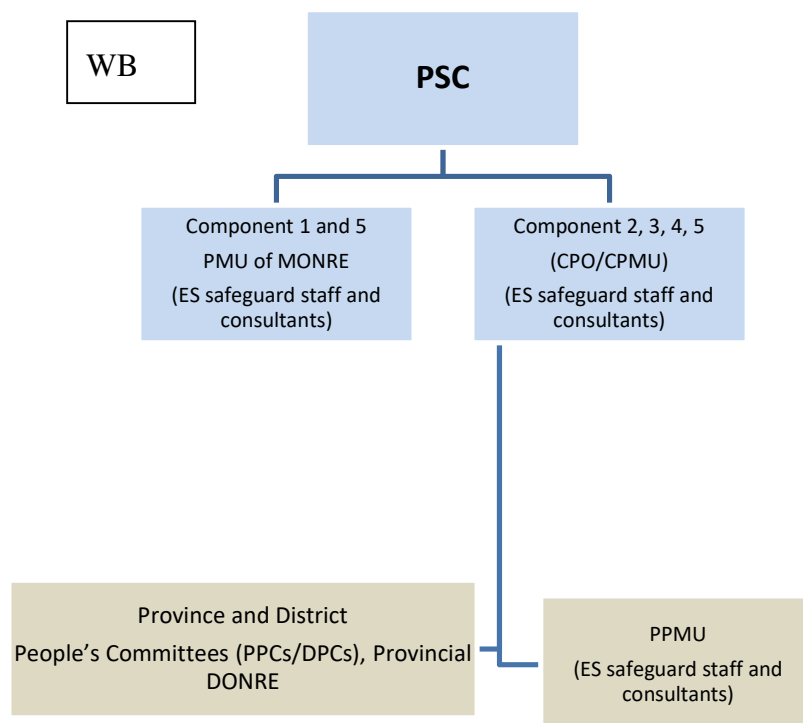


Figure 6.3: Organization structure for safeguard monitoring

Table 6.9: Institutional Responsibilities for the Project and Subproject Safeguard Implementation

Community/ Agencies	Responsibilities
Project Implementing Agency (IA) and PMU (The IA means MARD and MONRE while PMU here means the PMU of MONRE and CPMU and ICMB10 of MARD and PPMUs of the provinces)	<ul style="list-style-type: none"> - The IA will be responsible for overseeing the Project implementation including ESMF implementation and environmental performance of contractors. - PMU, representative of the IA, will be responsible for monitoring the overall Project implementation, including environmental compliance of the Project. PMU will have the final responsibility for ESMF implementation and environmental performance of the Project during the construction and operational phases. - Specifically the PMU will: (i) closely coordinate with local authorities in the participation of the community during project preparation and implementation; (ii) monitor and supervise ESMP implementation including incorporation of ESMP into the detailed technical designs and bidding and contractual documents; (iii) ensure that an environmental management system is set up and functions properly; (iv) be in charge of reporting on ESMP implementation to

	<p>the IA and the World Bank.</p> <ul style="list-style-type: none"> - In order to be effective in the implementation process, PMU will establish an Environmental and Social Unit (ESU) with at least two safeguard staff to help with the environmental aspects of the Project.
Environmental and Social Unit (ESU) under PMU	<ul style="list-style-type: none"> - The ESU is responsible for monitoring the implementation of the World Bank's environmental safeguard policies in all stages and process of the Project. Specifically, this unit will be responsible for: (i) screening subprojects against eligibility criteria, for environment and social impacts, policies triggered and instrument/s to be prepared; (ii) reviewing the subproject EIAs/EPPs and ESIAs/ESMPs prepared by consultants to ensure quality of the documents; (iii) helping PMU incorporate ESMPs into the detailed technical designs and civil works bidding and contractual documents; (iv) helping PMU incorporate responsibilities for ESMP monitoring and supervision into the TORs, bidding and contractual documents for the Construction Supervision Consultant (CSC) and other safeguard consultants (SSC, ESC, IMA, and EMC) as needed; v) providing relevant inputs to the consultant selection process; (v) reviewing reports submitted by the CSC and safeguard consultants; (vi) conducting periodic site checks; (vii) advising the PMU on solutions to environmental issues of the project; and viii) preparing environmental performance section on the progress and review reports to be submitted to the Implementing Agency and the World Bank.
PPMUs, DARDs, PPMU, PMU of MONRE	<ul style="list-style-type: none"> - As the subproject/activity owner, PPMU is responsible for the implementation of all the ESMP activities to be carried out under the Project, including fostering effective coordination and cooperation between the contractor, local authorities, and local communities during the construction phase. PPMU will be assisted by the environmental staff, safeguard consultants, and CSC/or field engineer. - Division of Aquaculture and Agriculture and Fishery Extension Center of Dong Thap province are responsible for livelihoods models. - During operation, the responsibility to operate the subproject components will be transferred to the subproject DPCs and they will be responsible for the monitoring of water quality and ecosystem before and after the operation of the semi-dyke, culverts, pump stations and submit water quality report to the Dong Thap DONRE one time per three months.
Construction Supervision Consultant (CSC) and/or Field Engineer	<ul style="list-style-type: none"> - The CSC will be responsible for routine supervising and monitoring all construction activities and for ensuring that Contractors comply with the requirements of the contracts and the ECOP. The CSC will engage sufficient number of qualified staff (e.g. Environmental Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance. - The CSC will also assist PPMU in reporting and maintaining close coordination with the local community.
Contractor	<ul style="list-style-type: none"> - Based on the approved environmental specifications (ECOP) in the

	<p>bidding and contractual documents, the Contractor is responsible for establishing a Contractor ESMP (CESMP) for each construction site area, submit the plan to PPMU and CSC for review and approval before commencement of construction. In addition, it is required that the Contractor get all permissions for construction (traffic control and diversion, excavation, labor safety, etc. Before civil works) following current regulations.</p> <ul style="list-style-type: none"> - The Contractor is required to appoint a competent individual as the contractor's on-site Safety and Environment Officer (SEO) who will be responsible for monitoring the contractor's compliance with health and safety requirements, the CESMP requirements, and the environmental specifications (ECOP). - Take actions to mitigate all potential negative impacts in line with the objective described in the CESMP. - Actively communicate with local residents and take actions to prevent disturbance during construction. - Ensure that all staff and workers understand the procedure and their tasks in the environmental management program. - Report to the PPMU on any difficulties and their solutions. - Report to local authority and PPMU if environmental accidents occur and coordinate with agencies and keys stakeholders to resolve these issues.
Independent Environmental Monitoring Consultants (IEMC)	<ul style="list-style-type: none"> - IEMC will, under the contract scope, provide support to PPMU to establish and operate an environmental management system, offers suggestions for adjusting and building capacity for relevant agencies during project implementation and monitor the CESMP implementation in both construction and operation stages. IEMC will also be responsible to support PPMU to prepare monitoring reports on ESMP implementation. - The IEMC will have extensive knowledge and experience in environmental monitoring and auditing to provide independent, objective and professional advice on the environmental performance of the Project.
Local community	<ul style="list-style-type: none"> - Community: According to Vietnamese practice, the community has the right and responsibility to routinely monitor environmental performance during construction to ensure that their rights and safety are adequately protected and that the mitigation measures are effectively implemented by contractors and the PPMU. If unexpected problems occur, they will report to the CSC and/or PPMU
Social organizations, NGOs and civil society groups	<ul style="list-style-type: none"> - These organizations could be a bridge between the PPC/DPC, communities, Contractors, and the PPMU by assisting in community monitoring. - Mobilizing communities' participation in the subproject, providing training to communities and Participating in solving environmental problems, if any.
Province and District People's Committees (PPCs/DPCs),	<ul style="list-style-type: none"> - Oversee implementation of subprojects under recommendations of DONRE and PPMU to ensure compliance of Government policy and regulations. DONRE is responsible for monitoring compliance with the Government environmental requirements.

6.4.2. Environmental compliance framework

6.4.2.1. Environmental Duties of the Contractors

The contractor firstly shall adhere to minimize the impact that may be result of the subproject construction activities and secondly, apply the mitigation measures under ESMP to prevent harm and nuisances on local communities and environment caused by the impacts in construction and operation stages.

Remedial actions that cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works)

The duties of the Contractor include but not limiting to:

- Compliance with relevant legislative requirements governing the environment, public health and safety;
- Work within the scope of contractual requirements and other tender conditions;
- Organize representatives of the construction team to participate in the joint site inspections undertaken by the Environmental Supervisor (ES) of the CSC;
- Carry out any corrective actions instructed by the Environmental Control Officer (ECO) of the PPMU and ES;
- In case of non-compliances/discrepancies, carry out an investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact;
- Stop construction activities, which generate adverse impacts upon receiving instructions from the ECO and ES. Propose and carry out corrective actions and implement alternative construction method, if required, in order to minimize the environmental impacts; Non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the ECO and ES.

6.4.2.2. Contractor's Safety and Environment Officer (SEO)

The contractor shall be required to appoint a competent individual as the Contractor's on-site safety and environment officer (SEO). The SEO must be appropriately trained in environmental management and must possess the skills necessary to transfer environmental management knowledge to all personnel involved in the contract. The SEO will be responsible for monitoring the contractor's compliance with the ESMP requirements and the environmental specifications. The duties of the SEO shall include but not be limited to the following:

- Carry out environmental site inspections to assess and audit the contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
- Monitor compliance with environmental protection measures, pollution prevention and control measures and contractual requirements;

- Monitor the implementation of environmental mitigation measures;
- Prepare audit reports for the environmental monitoring data and site environmental conditions;
- Investigate complaints and recommend any required corrective measures;
- Advise the contractor on environment improvement, awareness and proactive pollution prevention measures;
- Recommend suitable mitigation measures to the contractor in the case of non-compliance. Carry out additional monitoring of noncompliance instructed by the ECO/ES;
- Inform the contractor and ECO/ES of environmental issues, submit the contractor's ESMP Implementation Plan to the ECO/ES, and relevant authorities, if required;
- Keep detailed records of all site activities that may relate to the environment.

6.4.2.3. Independent Environmental Monitoring Consultant (IEMC)

In order to minimize the environmental impacts during the construction stage of the Project, the Project owner shall ensure that environmental quality monitoring requirements are established for the project. An Independent Environmental Monitoring Consultant (IEMC) appointed by CPMU shall carry out the monitoring.

- IEMC will be responsible for carrying out environmental sampling, monitoring and marking report during all stages of the Project. Environmental quality monitoring will be reported periodically to PPMU (every 06 months in the construction phase and in operation phase).
- IEMC will also supply specialized assistance to CPMU and ECO in environmental matters.

6.4.2.4. Environmental Supervision during the Construction phase

During the construction phase, a qualified Construction Supervision Consultant (CSC) reporting to the PPMU shall carry out the environmental supervision. The CSC is responsible for inspecting and supervising all construction activities to ensure that mitigation measures adopted in the ESMP are properly implemented and that the negative environmental impacts of the Project are minimized. The CSC shall engage a sufficient number of Environmental Supervision Engineers with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance. Specifically, ES will:

- Review and assess on behalf of the PPMU whether the construction design meets the requirements of the mitigation and management measures of the ESMP,
- Supervise site environmental management system of contractors including their performance, experience and handling of site environmental issues, and provide corrective instructions;
- Review the ESMP implementation by the contractors, verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results;
- Report ESMP implementation status to PPMU and prepare the environmental supervision statement during the construction phase; and

- Approve invoices or payments.

6.4.2.5. Compliance with Legal and Contractual Requirements

The constructions activities shall comply not only with contractual environmental protection and pollution control requirements but also with environmental protection and pollution control laws of the Socialist Republic of Viet Nam.

All the works method statements submitted by the Contractor to the ECO for approval shall also be sent to the ES to see whether sufficient environmental protection and pollution control measures have been included.

The ES shall also review the progress and program of the works to check that relevant environmental laws have not been violated and that any potential for violating the laws can be prevented.

The Contractor shall copy relevant documents to the SEO and the ES. The document shall at least include the updated work progress report, the updated work measure, and the application letters for different license/permits under the environmental protection laws, and all the valid license/permit. The SEO and the ES shall also have access, upon request, to the Site Log-Book.

After reviewing the documents, the SEO or the ES shall advise the ECO and the contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the SEO or the ES concludes that the status on license/permit application and any environmental protection and pollution control preparation works may not comply with the work measure or may result in potential violation of environmental protection and pollution control requirements, they shall advise the Contractor and the ECO accordingly.

6.4.2.6. Environmental Claims and Penalty System

a). Grievance redress mechanism

Within the Vietnamese legal framework citizen rights to complain are protected. As part of the overall implementation of the subproject, a grievance redress mechanism (GRM) will be developed by ESU of the PPMU which will identify procedures, responsible persons and contact information. It will be readily accessible, handle grievances and resolve them at the lowest level as quickly as possible. The mechanism will provide the framework within which complaints about environmental and safety issues can be handled, grievances can be addressed and disputes can be settled quickly. The GRM will be in place before the subproject construction commences.

During construction, the GRM will be managed by the contractor under the supervision of the CSC. The contractor will inform the communities and communes affected by the contract about the GRM in place to handle complaints and concerns about the subproject. This will be done via the Information Disclosure and Consultation Process under which the contractor will communicate with the affected communities and interested authorities on a regular basis: Meetings will be held at least quarterly, a monthly information brochure will be published, announcements will be placed in local media, and notices of upcoming planned activities will be posted, and so on.

All complaints and corresponding actions undertaken by the contractor will be recorded in the subproject safeguard monitoring report. Complaints and claims for damages could be lodged as follows:

- Verbally: direct to the CSC and/or the contractor safeguard staff or representative at the subproject office.
- In writing: by hand-delivering or posting a written complaint to the address specified.
- By telephone, fax, e-mail: to the CSC, the contractor safeguard staff or contractor's representative.

On receipt of a complaint, the CSC, contractor safeguard staff or representative will register the complaint in the complaints file and maintain a log of events pertaining to it thereafter, until its resolution. Immediately after receipt, three copies of the complaint will be made. The original will be kept in the file, one copy will be used by the contractor's safeguard staff, one copy will be forwarded to the CSC, and the third copy to the PPMU within 24 hours of the complaint being made.

Information to be recorded in the complaints log will include:

- The date and time of the complaint.
- The name, address and contact details of the complainant.
- A short description of the issue of complaint.
- Actions taken to address the complaint, including persons contacted and findings at each step in the complaint redress process.
- The dates and times when the complainant is contacted during the redress process.
- The final resolution of the complaint.
- The date, time and manner in which the complainant was informed thereof.
- The complainant's signature when a resolution has been obtained.

Small complaints will be dealt with within one week. Within two weeks (and weekly thereafter), a written reply will be delivered to the complainant (by hand, post, fax, e-mail) indicating the procedures taken and progress to date.

The main objective will be to resolve an issue as quickly as possible by the simplest means involving as few people as possible, at the lowest possible level. Only when an issue cannot be resolved at the simplest level and/or within 15 days, will other authorities become involved. Such a situation may arise, for example, when damages are claimed and the amount to be paid cannot be resolved or the cause of the damages determined.

World Bank Grievance Redress Mechanism: Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanism or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Subproject affected communities and individuals may submit their complaints to the WB's independent Inspection Panel which determines whether harms occurred or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the WB's attention, and Bank Management has been given an opportunity to respond. For

information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit www.worldbank.org/grs. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

b). Penalty System

In the compliance framework, if non-compliance with environmental regulations are discovered by ECO/CSC/ES/IEMC during the site supervision, 2% values of interim payment of the contractor of this month will be held back. The Contractor will be given a grace period (determined by CSC/ES) to repair the violation. If the Contractor performs the repairs within the grace period (confirmed by CSC/ES), no penalty is incurred and keeping money will be pay. However, if the Contractor fails to successfully make the necessary repairs within the grace period, the Contractor will pay the cost for a third party to repair the damages (deduction from keeping money).

In case of IEMC/CSC/ES not detected of non-compliance with environmental regulations of the contractor, they will be responsibility payment the cost to repair the violation of the contractor if it happens.

6.4.3. Reporting Arrangements

ESMP monitoring and reporting requirements are summarized in *Table 6.10*.

Table 6.10: Regular Reporting Requirements

No.	Report Prepared by	Submitted to	Frequency of Reporting
1	Contractor to the Employer	PPMU	Once before construction commences and monthly thereafter
2	Construction Supervision consultant (CSC)	PPMU	Weekly and monthly
4	Community Monitoring	PPMU/CSC	When the community has any complaint about the subproject safeguards implementation
5	PPMU/ICMB10	CPMU	Monthly
6	CPMU	WB	Every six-month

6.5. ESTIMATED ESMP COST

The EMP cost will comprise: (a) cost for resettlement and land acquisition; (b) cost for implementation of the mitigation measures by the contractor; (c) cost for supervision by the CSC; (d) cost for the Environmental Management Consultant (EMC) including monitoring of environmental quality; (e) cost for water quality/ecology monitoring during operation for at least 2 years; and (f) supervision and safeguard management costs incurred by PPMU and CPMU. All the costs will be included as the subproject cost (see *Table 6.11*).

- Cost for the implementation of the mitigation measures during construction will be part of the contract costs while the costs for monitoring by the CSC will be part of the construction supervision contracts.

- Cost for EMC and monitoring of environmental quality during construction is included in the subproject cost.
- Costs for PPMU operations related to the ESMP are provided for in the subproject management budget of the PPMU.
- Cost for technical assistance for safeguard training and technical services to be provided to mitigate the potential negative impacts during construction and operations of the sluice gates including the development of an operational plan for water supply plan in consultation with water users and key stakeholders.
- Cost for technical assistance for mitigation of potential negative impacts due to the implementation of the livelihood models especially (a) on poor farmers including undertaking socioeconomic survey, promoting aquaculture products, and implementation of the FFS on aquaculture models in the subproject areas and building farmers networks, and (b) for establishment of a registration system for aquaculture farming to mitigate potential negative impacts due to possible expansion of the models in the future.

It is estimated that the EMP implementation cost (excluding those to be included in civil works contract and CSC contract and RAP) will be about **4,450,080,000 VND** over a 4-year period.

Table 6.11: Cost for ESMP in the entire subproject

Activity	Source of fund	Total cost (VND)
(a) Resettlement and land acquisition	Part of subproject cost	
(b) Mitigation measures during the construction phase	Part of contract cost	
(c) Safety monitoring during the construction phase (48months x 5 million VND/months)	Part of subproject cost	240,000,000
(d) PPMU environmental staff	Part of subproject cost	240,000,000
(e) Environmental monitoring in the entire subproject (see)	Part of subproject cost	730,080,000
(f) Environmental monitoring consultant (EMC)	Part of subproject cost	240,000,000
(g) Technical assistance (national consultant) for safeguard training and development and consultation of the operation plan for subproject including meetings and workshops for 2 years during 2019-2021	Part of subproject cost	1,000,000,000
(h) Technical assistance (national consultant) for (i) planning and undertaking socio-economic survey for the farmers in the pilot sites and nearby areas for 3 years during (2019-2021) to evaluate effectiveness of the pilot models, (ii) development of a registration program on aquaculture	Part of subproject cost	2,000,000,000

Activity	Source of fund	Total cost (VND)
farming in the subproject and nearby areas, and (iii) development of FFS application and implementation of a series of technical workshops, TOT, and development of guidelines and awareness materials, and study visits and building farmer network etc. (to be implemented during 2017-2020)		

CHAPTER 7. PUBLIC CONSULTATION AND DISCLOSURE

This chapter describes the process of organizing public consultation and summary the result consultation and participation during environment and social impact assessment. According to the World Bank's policy on access to information, all draft safeguard instruments, including the EMP, are disclosed locally in an accessible place and in a form and language understandable to key stakeholders and in English at the InfoShop before the appraisal mission. EMP is locally disclosed at the sites and in the Vietnam Development Information Center of the World Bank in Hanoi.

7.1. SUMMARY ON THE PROCESS OF ORGANIZING PUBLIC CONSULTATION

7.1.1. Summary of consultation meetings for CPC and other organizations directly affected by the subproject

After finishing the draft EIA report, the Subproject Owner issued the official letter for a public consultation on the contents of the EIA report of the subproject: *“Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province), prepared in 2017”* together with the report of the ESIA of the subproject to the People's Committee and the Fatherland Front of 15 communes in 4 districts /town including: Thuong Phuoc 1, Thuong Thoi Hau A, Thuong Thoi Hau B (Hong Ngu district); Tan Hoi, Binh Thanh, An Binh A, An Binh B (Hong Ngu Town); An Hoa, An Long, Phu Ninh. Phu Thanh A, Phu Thanh B, Phu Tho (Tam Nong district) and Phu Loi, An Phong (Thanh Binh district) for comments. After receiving this official letter, all communes their comments in writing to the Subproject Owner, the official letters of the communes are attached in *Annex 4*.

7.1.2. Summary of consultation meetings for the community directly affected by the subproject

The Subproject owner coordinated with the DPC of Hong Ngu, Tam Nong, Thanh Binh district and Hong Ngu town to conduct 5 consultations with the affected communities on 16-17 November 2017 at the meeting hall of the DPC of Hong Ngu Town, Thuong Thoi Hau A CPC (Hong Ngu district), An Hoa CPC, Phu Thanh A CPC (Tam Nong district), Phu Loi CPC (Thanh Binh District).

In this meeting, the Subproject Owner discussed the subproject's content, impacts and mitigation measures on the environment and public health of the subproject and consulted the community about the contents presented.

The list of participants and minutes of public consultation meetings are attached in *Appendix 4*. The public consultation photos are in *Appendix 5*.

Table 7.1: Community consultation meetings on choosing livelihood models for the subproject

No	Date	Venue	Participants	Proposed livelihood models
1	14- 15/2/2017	Thanh Binh DPC	<ul style="list-style-type: none"> -Deputy Director of Dong Thap DARD -Agriculture Extension Office -Department of Aquaculture -Irrigation Department -Vice Director of Thanh Binh DPC -Department of Agriculture and Rural Development of Thanh Binh district -Department of Economic and Infrastructure of Thanh Binh district -An Phong and Phu Loi CPCs -Farmer groups in An Phong, Phu Loi communes -Consultant team: NN Construction Consulting Company + SIWRR 	<ul style="list-style-type: none"> -Model 1: 2 rice crops, 1 natural fish. -Model 2: 2 rice crops, 1giant freshwater shrimp. -Model 3: 1 rice, 1 natural fish, 1 aquatic plants.
2	16- 17/2/2017	Tam Nong DPC	<ul style="list-style-type: none"> -Deputy Director of Dong Thap DARD -Agriculture Extension Office -Department of Aquaculture -Irrigation Department -Vice Director of Tam Nong DPC -Department of Agriculture and Rural Development of Tam Nong district -Department of Economic and Infrastructure of Tam Nong district -Phu Thanh A, Phu Thanh B, Phu Tho, An Long, An Hoa, Phu Ninh CPCs -Farmer groups in Phu Thanh A, Phu Thanh B, Phu Tho, An Long, An Hoa, Phu Ninh communes -Consultant team: NN Construction Consulting Company + SIWRR 	<ul style="list-style-type: none"> -Model 1: 2 rice crops, 1 natural fish. -Model 2: 2 rice crops, 1giant freshwater shrimp. -Model 3: lotus, cultured fish, tourism combination

No	Date	Venue	Participants	Proposed livelihood models
3	21/2/2017	People's Committee of Hong Ngu town	<ul style="list-style-type: none"> -Deputy Director of Dong Thap DARD -Agriculture Extension Office -Department of Aquaculture -Irrigation Department -Vice Director of People's Committee of Hong Ngu town -Department of Agriculture and Rural Development of Hong Ngu town -Department of Economic and Infrastructure of Hong Ngu town -Tan Hoi, Binh Thanh, An Binh A and An Binh B CPCs -Farmer groups in Tan Hoi, Binh Thanh, An Binh A and An Binh B communes -Consultant team: NN Construction Consulting Company + SIWRR 	<ul style="list-style-type: none"> -Model 1: 2 rice crops, 1 natural fish. -Model 2: 2 rice crops, 1giant freshwater shrimp. -Model 3: 2 rice, 1 shrimp, natural fish.
4	22/2/2017	Hong Ngu DPC	<ul style="list-style-type: none"> -Deputy Director of Dong Thap DARD -Agriculture Extension Office -Department of Aquaculture -Irrigation Department -Vice Director of Hong Ngu DPC -Department of Agriculture and Rural Development of Hong Ngu district -Department of Economic and Infrastructure of Hong Ngu district -Thuong Thoi Hau A, Thuong Thoi Hau B and Thuong Phuoc CPCs -Farmer groups in Tan Hoi, Binh Thanh, An Binh A and An Binh B communes -Consultant team: NN Construction Consulting Company + SIWRR 	<ul style="list-style-type: none"> -Model 1: 2 rice crops, 1 natural fish. -Model 2: 2 rice crops, 1giant freshwater shrimp. -Model 3: 1 rice, 1 cash crop, 1 natural fish. -Model 4: 2 rice, duck, natural fish. -Model 5: 1 rice, 1 natural fish, aquatic plants (lotus, Sesbania sesban).

Table 7.2: Community consultation meetings on ESIA report for the subproject

No .	Time	Venue	Commune/district	Participants	Number of Participants	Contents
1	16/11/2017	Hong Ngu town	Binh Thanh, Tan Hoi, An Binh A, An Binh B communes, Hong Ngu town	<ul style="list-style-type: none"> -Representative of Hong Ngu town DPC -Department of Economic and Infrastructure of Hong Ngu town -Department of Agriculture and Rural Development of Hong Ngu town -CPCs -Fatherland Front Committee -Farmers' Association, Women's Union, Cadastral office... -Affected households -Dong Thap PPMU -Consultant (SIWRR) 	33	<ul style="list-style-type: none"> -The representative of Hong Ngu town People's Committee chaired the meeting, notice reasons and introduces the participants. -The subproject owner presented summary content of the subproject -The consultant presented a summary report of ESIA include, positive impacts of and negative impacts of subproject on the environment and public health, mitigation measures -Discussion
2	16/11/2017	Thuong Thoi Hau A CPC	Thuong Thoi Hau A, Thuong Thoi Hau B, Thuong Phuoc 1 communes, Hong Ngu district	<ul style="list-style-type: none"> -Department of Agriculture and Rural Development of Hong Ngu district -Department of Economic and Infrastructure of Hong Ngu district -Hong Ngu District Office of Natural Resources and Environment -CPCs -Fatherland Front Committees -Farmers' Association, Women's Union, Cadastral office... -Affected households 	42	<ul style="list-style-type: none"> -The representative of Department of Agriculture and Rural Development of Hong Ngu district chaired the meeting, notice reasons and introduces the participants -The subproject owner presented summary content of the subproject -The consultant presented a summary report of ESIA include, positive impacts of and negative impacts of subproject on the environment and public health, mitigation measures -Discussion (see subsection 7.2 about results

No .	Time	Venue	Commune/district	Participants	Number of Participants	Contents
				- Dong Thap PPMU - Consultant (SIWRR)		of Public Consultation)
3	17/11/20 17	An Hoa CPC	Phu Thanh B, An Hoa, Phu Long communes, and Tam Nong district	- Tam Nong DPC - Department of Economic and Infrastructure of Tam Nong district - CPCs - Fatherland Front Committees - Farmers' Association, Women's Union, Cadastral office... - Affected households - Dong Thap PPMU - Consultant (SIWRR)	71	- The representative of Tam Nong DPC chaired the meeting, notice reasons and introduces the participants. - The subproject owner presented summary content of the subproject - The consultant presented a summary report of ESIA include, positive impacts of and negative impacts of subproject on the environment and public health, mitigation measures - Discussion
4	17/11/20 17	Phu Thanh CPC	Phu Thanh A, Phu Ninh, Phu Tho communes and Tam Nong district	- Tam Nong DPC - Department of Economic and Infrastructure of Tam Nong district - Department of Agriculture and Rural Development of Tam Nong district - CPCs - Fatherland Front Committees - Farmers' Association, Women's Union, Cadastral office... - Affected households - Dong Thap PPMU - Consultant (SIWRR)	51	- The representative of Tam Nong DPC chaired the meeting, notice reasons and introduces the participants. - The subproject owner presented summary content of the subproject - The consultant presented a summary report of ESIA include, positive impacts of and negative impacts of subproject on the environment and public health, mitigation measures - Discussion

No .	Time	Venue	Commune/district	Participants	Number of Participants	Contents
5	17/11/20 17	Phu Loi CPC	Phu Loi, An Phong communes and Thanh Binh district	<ul style="list-style-type: none"> -Department of Agriculture and Rural Development of Thanh Binh district -CPCs -Fatherland Front Committees -Farmers' Association, Women's Union, Cadastral office... -Affected households -Dong Thap PPMU -Consultant (SIWRR) 	43	<ul style="list-style-type: none"> -The representative of Department of Agriculture and Rural Development of Thanh Binh district chaired the meeting, notice reasons and introduces the participants -The subproject owner presented summary content of the subproject -The consultant presented a summary report of ESIA include, positive impacts of and negative impacts of subproject on the environment and public health, mitigation measures -Discussion
6	27/10/20 18	Tram Chim NP	Tram Chim NP	<ul style="list-style-type: none"> -Dong Thap PPMU -CPO -Consultant (SIWRR) -WB 	15	<ul style="list-style-type: none"> -The representative of Department of Agriculture and Rural Development of Thanh Binh district chaired the meeting, notice reasons and introduces the participants -The consultant presented a summary contents of the subproject, focusing on the subproject items near Tram Chim NP -Discussion

7.2. Results of Public Consultation

7.2.1. Results of public consultation on livelihood models

7.2.1.1. In Thanh Binh district

- Currently, there are 459 ha of land in An Phong commune locating in the subproject area. The main production here is 2-crop rice. There are no other farming and livestock activities.
- Many households are not local. They come for cultivation and live in other places. Therefore, it is difficult to deploy the models.
- Some households used to raise giant freshwater prawn (*Macrobrachium rosenbergii*) but it was not effective. Therefore, this model will be difficult to return. In the years that lack of water, raising shrimp was failed because they did not grow up and the efficiency was not high. Rice is an organic product. If people cultivate 1 rice crop - 1 shrimp crop, the investment cost will be high and the capital requires large, so farmers cannot do it, and intensive farming need a very big capital. Therefore, the agreed model is 2 rice crop – 1 shrimp crop. The spraying insecticides for rice when intercropping with shrimps and net-raising should be paid attention to prevent loss.
- Some households raise “Ca Sac” (*Trichogaster pectoralis*) with a total area of about 2 hectares.
- Agree with the 2-rice crop - natural fish model, temporarily planting stick, aromatic, delicious high-yield rice, then developing variety in the next stage.
- The local chilly planting model remains spontaneous, depending on the market and it must be a good price, for example before “Tet”, the chilly price may reach up to more than 60,000 VND/kg but after “Tet”, it is 17 -20,000 VND/kg. In addition, people can grow peppercorn, sesame, beans, etc. Regardless of flood or not, this model still works well.
- Community management and harvesting of natural fresh fish should also be taken into account to ensure equity among local people with those who own land but live in other communes.
- There was a model of raising fish (*Hypophthalmichthys*, *Trichogaster pectoralis*, etc.) but it was not effective; the fish is easier to breed than shrimp but have a low price.

7.2.1.2. In Tam Nong district

- Agree with the production model of 2 rice crop - 1 fish crop (natural fish). It should be paid attention to community management and harvest of natural fish.
- The model of lotus planting has been relatively well in Compartment No.27, lotus leaves can be made tea and consumable. Compartment No. 27 is adjacent to Tram Chim National Park, which can be integrated with the tourism like in Thap Muoi, which is supported by IUCN. Agree on the lotus model, feeding fresh fish combined with tourism in Compartment No. in Phu Tho commune.
- The model for raising giant freshwater prawn (*Macrobrachium rosenbergii*) has been cultured in Compartment No.: 15, 16, 17 in Cu Lao Chim (bird island) of Phu Thanh B commune. However, in recent years, this model has not been effective due to the problems

of breeding stock, price, low flood water, and without infrastructure, therefore shrimps are not big. Water pumping is expensive and water from polluted fields is very difficult to control. Shrimps usually die in 2 stages: after harvesting rice for 1 month due to rot stubble and when water will be about to drain. As the farming giant freshwater prawn lasts nearly 1 year, it should be considered intercropping with 2 rice crops.

- If only feeding shrimp, farmers will suffer loss. Cu Lao Chim is gradually moved to specialized shrimp farming. Continuously raising shrimp for 2-3 years will spoil the soil and shrimps will be affected with diseases, which should be intercropped with rice cultivation.
- Currently, white leg shrimps (*Litopenaeus vannamei*) are raising combined with giant freshwater prawn but white leg shrimps are mainly.

7.2.1.3. *In Hong Ngu town*

- Agree with the model of 2 rice crop - 1 natural fish crop. However, care should be taken to the preservation of products. Exploitation is difficult. There is the competition from a large number of junks coming from An Phu and An Giang. Therefore, the harvest here is not effective. There should be measures for propaganda and community management, the establishment of cooperatives and craft villages for processing fish sauce, dried fish. The annual volume of fishing is large but consumable, serving the processing of fish sauce and dried fish. In the area, there is the fish sauce village of An Lac, which even consumes fish imported from Cambodia for processing fish sauce and dried fish. The highlight is the brand name of "Ca Linh" (*Henicorhynchus siamensis*) fish sauce. However, an objective factor making this model difficult is that the majority of farmers are moving from other places to this production area, not local people so that the arrangement of this model in flood seasons should be noted to ensure fairness and avoid conflicts of interest.
- The model of rice and giant freshwater prawns in recent years has been reduced due to many objective conditions such as floods are too large some years while too small some years, and households with a large area of 8-10ha get poor management, so they lost a lot. At the same time, the infrastructure has not met the production because there are not half-way dikes to keep water. In Hong Ngu town, flood drains quickly within about 10 days. If there is infrastructure, half-way dike can keep 1m of water to meet the effective production model of rice - prawns.
- Agree with 2 rice crop - 1 shrimp/natural fish. In the condition of the years without floods, it is possible to flexibly change the species during flood season.

7.2.1.4. *In Hong Ngu district*

- Agree with the production model of 2 rice crop - 1 natural fish crop. It should be noted the community management and harvest of natural fish. At present, natural fishing is mainly by local people. When implementing the model, it is necessary to balance and have the method of management, dividing fair products for people who have land but live in other places to avoid conflicts.
- Seasonal rice model: Previously, local people grew seasonal rice, but now they do not plant anymore because they have half-way dikes and get stable 2-rice crops. The rice is high-yield rice. The aquatic plants are mainly cork, water mimosa, waterlily, ipomoea aquatica, lotus.

- Local people have stopped the giant freshwater prawn model for about 5 years due to ineffectiveness. The reason is the same as the above districts, due to objective and subjective factors such as breeding stock, price, low water, poor infrastructure.
- Agree with crop planting model in some areas with high terrain. The plants may be chili, corn, sesame.
- The rice - duck model. This model has been successful in Thuong Thoi Tien commune with a high-value brand name. It can be piloted for the subproject area.

7.2.2. Results of public consultation on ESIA report

7.2.2.1. Opinions of commune people's committees and organizations

- Agreed with the contents stated in the EIA reports of the sub-projects and expect the TDA to soon implement, help economic development, social and local infrastructure.
- The area of land occupied for construction works should be compensated and supported in accordance with transparent regulations and procedures in the implementation process. Broad disclosure of information to the local authorities and the entire population to contribute ideas, capture information from the preparation of investment. Coordinate with local authorities in the implementation of compensation, clearance.
- In the construction phase, negative impacts on the environment and local communities will be mitigated, both locally and temporarily. The main impact is clearance, transportation of materials in the construction process.
- Ensure traffic safety, installation of signboards for vessels operating on the Khang Chien canal and a number of canals to conduct dredging. In the evening, there must be a warning light for ships to pass, avoid accidents.
- The development of a group of commodity products when there is no output for consumption can be a negative factor for the production models of the subproject. Need to find the output for the shrimp, organic rice, and floating rice through trade promotion, introduction of products on the domestic and foreign fairs.
- Most of the people in the subproject area have average, low and untrained living standards, so the adoption of technical sciences in the implementation of models is a must. It is necessary to provide training courses for local people on techniques for converting new livelihoods models through the introduction of theoretical and modeling guidance and to send agricultural and fishery extension teams directly to localities where they are needed.
- Provide financial support to farmers directly involved in the model and stable output for products derived from the model.
- Ensure labor safety and environmental sanitation during the implementation of the subproject.

7.2.2.2. Opinions of community representatives

- Comments from the community of Hong Ngu district:
 - Agreed with the contents stated in the EIA report of the subproject.

- The rental price of land for farmers to build the model of raising giant freshwater shrimp is high now; farmers would like to get more support for the subproject owner to develop this model.
- People do not know how to conduct the subproject livelihood models, they suggest that the subproject owner will organize training for them.
- Whether Chin Hue pumping station to be located within the subproject area or not?
- Comments from the community of Hong Ngu town:
 - People want to know about the policy for compensation and support for 2ha of land loss in An Binh A commune?
 - Participants wonder about the environmental impacts of the subproject livelihood models:
- Comments from the community of Tam Nong district:
 - Whether the subproject lead to change the land use planning or not?
 - The subproject will be implemented in 3-4 years, it is recommended that contractors keep pace with schedule, avoiding long-term construction, which will affect people's water supply
 - Activities for construction will be implemented in 4 years, it is recommended there need to divide the construction activities into phases
 - Whether the subproject owner supports fish fingerlings for farmers in the model of rice - natural or not?
 - It is recommended that during the construction phase, training should be conducted so that people are not disturbed when implementing the models.
- Comments from the community of Thanh Binh district:
 - Whether the subproject owner will buy the output from the subproject model or not?
 - Whether the subproject owner will compensate and support for people who lost their land for the subproject implementation or not?
- Comments from Tram Chim NP:

In order to ensure the progress of project implementation and to limit the impacts of the subproject on biodiversity conservation and ecosystems, Tram Chim NP recommends that the project owner should implement the following:

- Ensure the emission and noise during construction meet the national regulations.
- Avoid impacts on the inner ecological environment of the Park, especially water birds and plant and animal species
- The livelihood model should be limited to the use of plant protection agents and antibiotics to minimize environmental pollution. In the process of operation, the tourism services of the livelihood model, there should be cooperation with the Tram Chim NP and Tourism Center.

The public consultation minutes are included in Appendix 5.

7.2.3. Opinions and commitments of the Subproject Owner on recommendations and requirements of concerned agencies, organizations and communities in the consultations

7.2.3.1. For livelihood models

After receiving comments of local people and authorities on livelihood models, the subproject owner coordinated with the consultant to select suitable models for the natural conditions of each district and in line with the expectations of the people.

7.2.3.2. For ESIA report

- For comments from CPCs: After receiving comments from the CPCs in the subproject area, the PPMU responses as follows:

- The subproject owner will record and add comments in the ESIA report. At the same time, the subproject owner commits to comply with the mitigation measures proposed in this ESIA report.
- For contractors: The subproject owner will include provisions on environmental protection in the contract documents, requiring contractors to implement the measures stated in the report. In addition, Dong Thap PPMU will regularly monitor the compliance of contractors with environmental protection measures during the construction phase to minimize environmental impacts.

- For comments from the community:

- Regarding training for local people: The subproject owner allocate budget to support and train people in demonstration sites as well as households in the subproject area.
- Regarding supporting fund for land renting for farmers to build the model of raising giant freshwater prawn and supporting fingerlings in the model of natural rice and fish: The subproject has funding support, seed, techniques for people at demonstration sites at each level for each type of production model.
- Regarding compensation for dumping sites and damage caused by construction works: In accordance with WB safeguard policies and Vietnamese law and regulation, all land loss will be supported and compensated as stated in RAP. At the same time, people who lose their land are also supported on a career change and other policies in accordance with the subproject RAP.
- Regarding long construction activities affecting water sources for production: The subproject works will not be spread out at the same time but will be divided into components and by rolling method to avoid annual floods, so this impact is short and small
- Regarding conducting training for people during the construction of the works so not disturbed when implementing the models: the subproject will conduct training for households according to the approved plan, ensuring people are acquainted with the techniques during the model implementation.
- Regarding buying outputs of the subproject models: The subproject owner will not directly purchase the output, but will support branding and finding market for the outputs

- Regarding changing land use planning: the subproject implementation do not change the land use planning, but the direction of agricultural production in the direction of adaptation to climate change conditions, sea level rise based on the current land use.
- In addition, the subproject owner undertakes and supervises the contractors to ensure that the works are on schedule and in accordance with the approved design in order to minimize impacts on the natural and socio-economic environment in the subproject area.

7.3. Information disclosure

According to the request of the Government and the WB, Dong Thap PPMU will disseminate the draft of this report in Vietnamese version at the CPO office, DARD office, PPC office, DPC office and subproject communes. The English version of the report will be published on the WB's Infoshop. The official versions of this report will also be disclosed at the locality and the Infoshop.

CONCLUSIONS, RECOMMENDATIONS AND COMMITMENTS

1. Conclusions

In general, the Subproject is feasible and in line with the socio-economic development plan of Dong Thap province as well as the irrigation and rural development planning in the Mekong Delta. The Subproject meets the needs of the socio-economic development in Dong Thap province and supports the salinity control to serve local livelihoods and production.

The assessment and preparation of the Subproject's environmental and social impact assessment report show that the mitigation measures designed for the Subproject are sufficient enough to mitigate negative impacts. However, in order to ensure more adequacy, the environmental monitoring program for the construction of the Subproject was proposed. The positive impacts of the subproject include improvement of living conditions of people in the area, promotion of the socio-economic development and actively response to climate change and sea water level rise.

During the preparation phase, the subproject will cause impacts on the environment and local people in the subproject area. The subproject will acquire land from households and affect the living and production of the people. The removal and clearance of buildings and structures out of the subproject area will generate negative impacts on the environment. In addition, within the subproject site where residue UXOs, the risk of UXOs will affect the quality of the work and life of workers and people around the construction site. However, these impacts will be mitigated through the implementation of compensation and resettlement in line with the policy set out in the RPF of MD-ICRSL project and RAP of this subproject. The subproject owner will be contracted to the UXO clearance authority and the contractor will only carry out if the construction sites are safe.

During the construction phase, there will be negative impacts including vehicle and equipment exhaust emissions, smoke, dust and noise from construction equipment during the construction of the subproject components, wastewater from construction workers and construction activities, construction solid waste, dredged sludge and some contaminated waste, among others. These have been identified in the ESMP. These impacts can be mitigated by ensuring that the subproject contractors comply with the provisions of their contracts, including those which relate to environmental impacts. The PPMU and their CSC and EMC will be responsible for ensuring that this compliance occurs. In accordance with their contracts, contractors will be required to prepare the Contract Specific Environmental Plan (CSEP) describing detailed environmental safeguard actions. The CSEP will be approved by PPMU and supervised by CSCs prior to the work commencing. Periodic monitoring reports will be prepared by the EMC and the results will be submitted to CPMU and the World Bank (as needed).

During the operation, the Subproject will cause such negative impacts as damages to embankments, culverts, pumping stations and wastes from the implementation of the livelihood models, which will affect the psychology and income of people. There may be impacts from disease risks, water conflicts among the areas implementing the livelihood models. However, these impacts will be minimized through training to raise public awareness of the impacts of waste, diseases, experiences in implementing livelihoods models, linking and forecasting market. Propaganda and education to raise awareness of the protection of the works will ensure long-term operation and the environment is always well protected.

Developing brands for goods from livelihood models, marketing and expanding output markets and production area planning for management and control while controlling the environmental impacts will be implemented at the same time

The Subproject Owner commits to be responsible to the state and local environment management agencies, always implements commitments and solutions in the environmental protection to minimize, control negative impact within the environment and nature regulations.

In addition, environmental monitoring should be undertaken to ensure that the Subproject's activities do not cause negative impacts on the environment. Monitoring results will be reported periodically to Dong Thap DONRE.

2. Recommendations

This is the state-funded subproject for community-based economic development. During the Subproject's construction, impacts on the natural and social environment may be from negligible and moderate as discussed in detail in Chapter 3 and the response and control plans are discussed in Chapter 4. Thus, mitigation measures to environmental impacts caused by the Subproject will be designed but if only the Subproject Owner and the construction companies implement the mitigation measures, it will be very difficult to resolve thoroughly the problems that arise and need to be coordinated among the local authorities in the Subproject area and Dong Thap PPC as well as the concerned departments and agencies (National Fatherland Fronts, Farmer's Unions, Women's Unions, Youth Unions, Police, etc. at all levels) and the professional agencies (Water Resource Agency, Agriculture and Fishery Extension Center, Environmental Protection Agency, etc.) and the coordinated activities in the capacity and tasks to limit environmental impacts to ensure the Subproject's effective implementation.

3. Commitments

The subproject owner commits to strictly implement measures to minimize the environmental impacts as stated in Chapter 4, the environmental and social management plans described in Chapter 5 in accordance with the environmental standards and regulations promulgated by the State; implement community commitments as stated in Section 6.3, Chapter 6 of this EIA report. Comply with the general regulations on environmental protection related to the phases of the subproject as follows:

- Report to the subproject CPCs on the content of the decision approving the EIA report together with the copy of approval decision.
- Public listing in localities of the approved EIA summary report, clearly stating the type and volume of wastes; technology and equipment for waste treatment; the level of treatment according to the characteristics of the waste compared to the standard; other measures for environmental protection.
- Environmental protection during the construction phase: implement the measures to mitigate negative impacts on the environment caused by the subproject and conduct environmental monitoring in accordance with the requirements set out in the approved EIA report as well as other requirements stated in the decision approving the EIA report. During the implementation of the construction activities of the subproject, there are changes and adjustments in the contents and measures of environmental protection have been approved or certified, must be reported in writing to the Dong Thap DONRE and only

implement these changes and adjustment after the written approval of the competent authority.

- Be responsible to cooperate and create favorable conditions for the State management agency in charge of environmental protection to supervise and inspect the implementation of environmental protection contents and measures of the subproject; Provide adequate information, relevant data when requested.
- Monitoring and supervision program will be implemented during the construction and operation of the subproject. Funds for environmental monitoring will be prepared by the Subproject Owner;
- During the subproject implementation, if violating international conventions, Vietnamese standards on environment and occurrence of environmental incidents, the subproject owner must take full responsibility before Vietnamese law.
- During the preparation, construction and operation phase, the subproject owner will implement measures to mitigate adverse impacts on the environment as described in Chapter 4.
- Commitment to implement regulations on environmental protection:
 - Cooperate with local authorities, agencies to implement regulations related to environmental protection of the subproject area.
 - Full responsibility before Vietnamese law if violating the Vietnamese regulations and commit to compensate and remedy environmental pollution if environment incidents or risks occur during subproject implementation.
 - Restoration of the environment in accordance with the law on environmental protection after closing the subproject.

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6. Truong Quoc Phu, and Tran Kim Tinh, 2012. *Chemical composition of catfish pond bottom (Pangasiusodon hypophthalmus)*. Journal of Science 2012: 22a Tr. 290-299. Can Tho University.
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APPENDIX

APPENDIX 1: RELATED LEGAL DOCUMENTS

AO GUY

А, ПМС

- Hoa Tộc

Nguyễn Tân Dũng có ý kiến như sau:

quy định trước khi tiến hành đàm phán Dự án.

Thế tướng Chính phủ.

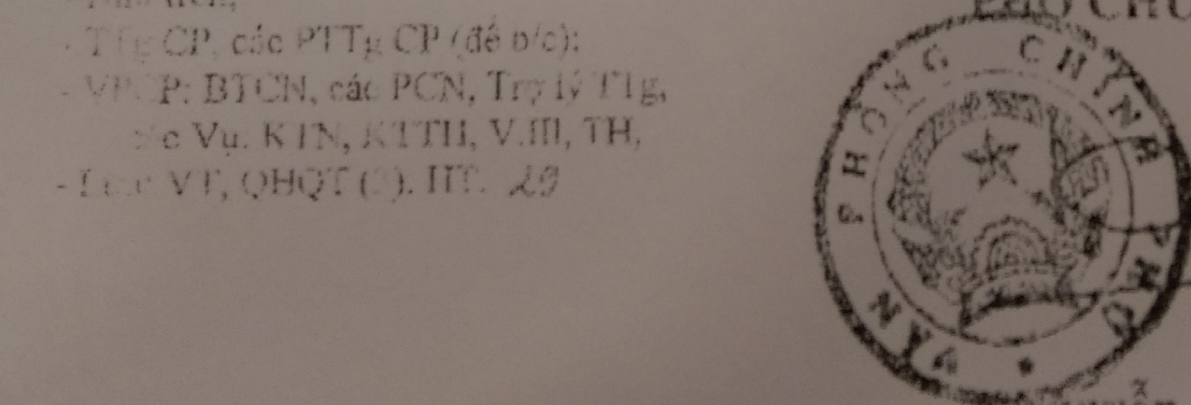
Văn phòng Chính phủ xin thông báo để các cơ quan biết, thực hiện./

Nơi nhận:

- Như trên;
- T_g CP, các PTT_g CP (để b/c):
- VP/CP: BTCN, các PCN, Trộn lỷ T_gg,
s/c V_u, KIN, KTHH, V.M, TH,
- Các VI, OHQT (C). HT. 29

Nơi nhận:
Như trên;

KT. BỘ TRƯỞNG, CHỦ NHIỆM
PHÓ CHỦ NHIỆM



Nguyễn Sỹ Hiệp

Số: ~~1825~~/TTg-QHQT

Hà Nội, ngày 14 tháng 10 năm 2015

V/v lựa chọn nhà thầu tư vấn chuẩn bị
Dự án “Chống chịu khí hậu tổng hợp
và sinh kế bền vững đồng bằng sông
Cửu Long”, dự kiến vay vốn WB

Kính gửi:

- Các Bộ: Nông nghiệp và Phát triển nông thôn, Tài nguyên và Môi trường, Kế hoạch và Đầu tư, Tài chính;
- Ngân hàng Nhà nước Việt Nam.

Xét đề nghị của Bộ Nông nghiệp và Phát triển nông thôn tại các văn bản số: 6628/TTr-BNN-XD ngày 14 tháng 8 năm 2015 và 7851/BNN-XD ngày 21 tháng 9 năm 2015, ý kiến của Bộ Tài nguyên và Môi trường tại văn bản số 3784/BTNMT-IIIQT ngày 11 tháng 9 năm 2015, của Bộ Tài chính tại văn bản số 12847/BTC-ĐT ngày 15 tháng 9 năm 2015, của Bộ Kế hoạch và Đầu tư tại văn bản số 6635/BKHĐT-QLĐT ngày 18 tháng 9 năm 2015 về việc lựa chọn nhà thầu tư vấn chuẩn bị Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cửu Long”, dự kiến vay vốn Ngân hàng Thế giới (WB), Phó Thủ tướng Chính phủ Hoàng Trung Hải có ý kiến như sau:

1. Đồng ý đổi tên Dự án “Phát triển nông thôn tổng hợp nhằm cải thiện khả năng thích ứng với biến đổi khí hậu vùng đồng bằng sông Cửu Long” thành Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cửu Long”.

2. Bổ sung danh mục Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cửu Long” và cho phép điều chuyển, bố trí vốn đối ứng trong tổng nguồn vốn đối ứng đã giao cho Bộ Nông nghiệp và Phát triển nông thôn năm 2015 để chuẩn bị Dự án. Bộ Nông nghiệp và Phát triển nông thôn hoàn tất các thủ tục cần thiết theo quy định.

3. Đồng ý về nguyên tắc Bộ Nông nghiệp và Phát triển nông thôn được áp dụng hình thức lựa chọn nhà thầu trong trường hợp đặc biệt “ký hợp đồng trực tiếp” theo quy định tại Điều 26 Luật Đấu thầu để lựa chọn nhà thầu tư vấn chuẩn bị Dự án.

Bộ Nông nghiệp và Phát triển nông thôn chủ trì, phối hợp với Bộ Tài nguyên và Môi trường và các cơ quan liên quan thực hiện việc lựa chọn nhà thầu trong trường hợp đặc biệt theo đúng quy định hiện hành và tự chịu trách nhiệm về quyết định của mình, bảo đảm tiết kiệm, hiệu quả và công khai, minh bạch.

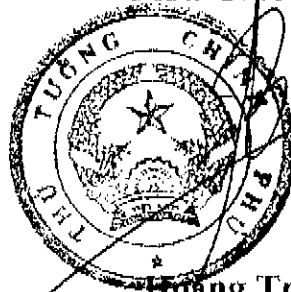
4. Bộ Nông nghiệp và Phát triển nông thôn phối hợp với Bộ Tài nguyên và Môi trường, Bộ Kế hoạch và Đầu tư và các cơ quan liên quan đẩy nhanh

tiến độ chuẩn bị Dự án, sớm hoàn thiện thủ tục thẩm định, trình Thủ tướng Chính phủ phê duyệt danh mục Dự án nêu trên theo quy định hiện hành, bảo đảm tiến độ đã cam kết với WB./.

Nơi nhận :

- Như trên;
- TTgCP, các PTTg CP;
- VPCP: BTCN, các PCN, Trợ lý TTg, các Vụ: KTN, KTTH, TH;
- Lưu: VT, QHQT (3). HT. *28*

**KT, THỦ TƯỚNG
PHÓ THỦ TƯỚNG**



Hoàng Trung Hải

Số: *882* /QĐ-BNN-HTQT

Hà Nội, ngày 19 tháng 3 năm 2015.

QUYẾT ĐỊNH

**V/v: Giao Ban Quản lý Trung ương các dự án Thủy lợi (CPO) làm Chủ dự án
giai đoạn chuẩn bị đầu tư "Dự án Phát triển nông thôn tổng hợp nhằm
cải thiện khả năng thích ứng với biến đổi khí hậu vùng
Đồng bằng Sông Cửu Long"**

BỘ TRƯỞNG BỘ NÔNG NGHIỆP VÀ PHÁT TRIỂN NÔNG THÔN

Căn cứ Nghị định số 199/2013/NĐ-CP ngày 26/11/2013 của Chính phủ Quy định chức năng, nhiệm vụ, quyền hạn, và cơ cấu tổ chức của Bộ Nông nghiệp và Phát triển nông thôn;

Căn cứ Luật xây dựng số 50/2014/QH13 ngày 18/06/2014 và Luật Đầu tư công số 49/2014/QH 13 ngày 18/06/2014;

Căn cứ các Nghị định của Chính phủ: số 38/2013/NĐ-CP ngày 23/4/2013 về Quản lý và sử dụng nguồn hỗ trợ phát triển chính thức ODA và nguồn vốn vay ưu đãi của các nhà tài trợ; số 12/2009/NĐ-CP ngày 12/02/2009, số 83/2009/NĐ-CP ngày 15/10/2009 về quản lý dự án đầu tư xây dựng công trình; số 112/2009/NĐ-CP ngày 14/12/2009 về quản lý chi phí đầu tư xây dựng công trình; số 15/2013/NĐ-CP ngày 06/02/2013 về quản lý chất lượng công trình xây dựng;

Căn cứ Thông tư số 01/2014/TT-BKHĐT ngày 09/01/2014 của Bộ Kế hoạch và Đầu tư hướng dẫn thực hiện một số điều của Nghị định số 38/2013/NĐ-CP, ngày 23/4/2013 về quản lý và sử dụng nguồn hỗ trợ phát triển chính thức (ODA) và nguồn vốn vay ưu đãi của các nhà tài trợ;

Căn cứ Thông tư số 49/TT-BNNPTNT ngày 04/8/2009 của Bộ NN&PTNT hướng dẫn quản lý và sử dụng nguồn hỗ trợ nước ngoài của Bộ NN&PTNT;

Căn cứ Quyết định số 3239/QĐ-BNN-TCCB ngày 22 tháng 10 năm 2008 của Bộ trưởng Bộ Nông nghiệp và Phát triển nông thôn quy định chức năng, nhiệm vụ, quyền hạn và cơ cấu tổ chức của Ban Quản lý Trung ương các dự án thủy lợi;

Căn cứ văn bản số 1447/VPCP-QHQT ngày 02/3/2015 của Văn phòng Chính phủ V/v nâng cao hiệu quả hợp tác với các nhà tài trợ ODA và vốn vay ưu đãi;

Căn cứ Quyết định số 790/QĐ-BNN-HTQT ngày 10/3/2015 của Bộ trưởng Bộ Nông nghiệp và Phát triển nông thôn về việc thành lập Tổ chuẩn bị

dự án "Dự án Phát triển nông thôn tổng hợp nhằm cải thiện khả năng thích ứng với biến đổi khí hậu vùng Đồng bằng Sông Cửu Long"

Xét đề nghị của Ban Quản lý Trung ương các dự án thủy lợi (CPO) tại văn bản số 276/CPO-WB9 ngày 06/3/2015 về việc một số nội dung chuẩn bị "Dự án Phát triển nông thôn tổng hợp nhằm cải thiện khả năng thích ứng với biến đổi khí hậu vùng Đồng bằng Sông Cửu Long";

Theo đề nghị của Vụ trưởng Vụ Hợp tác quốc tế,

QUYẾT ĐỊNH:

Điều 1. Giao Ban Quản lý Trung các dự án Thủy lợi là Chủ dự án giai đoạn chuẩn bị đầu tư "Dự án Phát triển nông thôn tổng hợp nhằm cải thiện khả năng thích ứng với biến đổi khí hậu vùng Đồng bằng Sông Cửu Long", vay vốn Ngân hàng Thế giới.

Ban Quản lý Trung các dự án Thủy lợi chịu trách nhiệm tổ chức thực hiện theo đúng quy định hiện hành.

Điều 2. Chánh Văn phòng Bộ, Vụ trưởng các Vụ: Hợp tác quốc tế, Kế hoạch, Tài chính, Tổ chức cán bộ; Tổng cục trưởng các Tổng cục: Thủy lợi, Thủy sản, Lâm nghiệp; Cục trưởng Cục quản lý xây dựng công trình; Trưởng Ban Quản lý Trung các dự án Thủy lợi và thủ trưởng các đơn vị liên quan chịu trách nhiệm thi hành Quyết định này./.

Nơi nhận:

- Như Điều 2;
- Văn phòng Chính phủ;
- Bộ KH&ĐT, TC, NHHN, TNMT;
- Lưu VT, HTQT (NHL-10).



BỘ TRƯỞNG

Cao Đức Phát

Đề xuất dự án Đồng bằng sông Cửu Long kết hợp thích ứng biến đổi khí hậu và sinh kế bền vững (P153544)

Đoàn nhận dạng dự án: từ 26/11/2014 đến 15/12/2014

Đoàn kỹ thuật: từ 03/02/2015 đến 05/02/2015

Dự thảo Biên bản ghi nhớ

I. Tóm tắt

1 nhóm Ngân hàng Thế giới bao gồm Anjali Acharya (Đội trưởng), Greg Browder (đồng Đội trưởng), and Cao Thăng Bình (đồng Đội trưởng) đã tiến hành đợt giám sát nhận dạng dự án đề xuất Đồng bằng sông Cửu Long kết hợp thích ứng biến đổi khí hậu và sinh kế bền vững (P153544). Các đại diện của Bộ Tài nguyên & Môi trường và Bộ Nông nghiệp và Phát triển nông thôn cũng tham gia cùng đoàn và giúp đoàn đối thoại với chính quyền địa phương. Ngoài ra, thành phần đoàn còn bao gồm đại diện của các đối tác xây dựng dự án và hỗ trợ kỹ thuật tại Đồng bằng sông Cửu Long. Đoàn bắt đầu tổ chức các cuộc thảo luận về kỹ thuật và đi thực địa từ ngày 26/11 đến ngày 15/12/2014; tiếp đó là đoàn giám sát về kỹ thuật bắt đầu từ ngày 03/02 đến 05/02/2015. Kết quả của cả 2 đoàn đều được phản ánh trong Biên bản ghi nhớ này.

Đoàn đã tổ chức họp với các cán bộ chủ chốt thuộc Bộ Tài nguyên và Môi trường (Bộ TN&MT), Bộ Nông nghiệp và Phát triển nông thôn (Bộ NN&PTNT) và Ủy ban nhân dân (UBND) các tỉnh được lựa chọn để thảo luận về nội dung dự án đề xuất và để đạt được các kết quả đầu vào. Đoàn đã tiến hành đi thực địa tại các tỉnh Cà Mau và Kiên Giang trong suốt đợt nhận dạng dự án để xem xét các thông tin sẵn có, tiến hành đánh giá sơ bộ và xác định những thách thức về thể chế và cơ sở hạ tầng. Đoàn cũng đã tổ chức các cuộc thảo luận kỹ thuật với đơn vị tư vấn ICEM về Hỗ trợ kỹ thuật đang được tiến hành cho xây dựng Khung hỗ trợ ra quyết định. Tiếp theo Diễn đàn về Đồng bằng sông Cửu Long, đoàn đã tổ chức đợt giám sát về kỹ thuật tại tỉnh Bến Tre để hiểu rõ hơn những thách thức cụ thể. Chương trình làm việc của đoàn và tóm tắt thành phần tham gia được trình bày trong Phụ lục 1 và 2.

Đoàn rất cảm ơn vì sự nhiệt tình và hỗ trợ từ phía Chính phủ Việt Nam cho dự án đề xuất. Đoàn gửi lời cảm ơn đến ông Trần Kim Long - Vụ trưởng Vụ Hợp tác Quốc tế - Bộ NN&PTNT, ông Phạm Phú Bình - Vụ trưởng Vụ Hợp tác Quốc tế - Bộ TN&MT và các cán bộ đã tổ chức họp và đi thực địa. Sự hỗ trợ mạnh mẽ từ phía các cơ quan của Chính phủ Việt Nam là rất cần thiết cho sự thành công của dự án đa ngành này. Cuối cùng, đoàn bày tỏ sự trân trọng về sự hỗ trợ và kết quả đầu vào từ phía DFAT, GIZ, Hà Lan và IUCN trong suốt quá trình đi thực địa.

Biên bản ghi nhớ này được gửi đến các đại diện của Bộ TN&MT và Bộ NN&PTNT liên quan đến công tác chuẩn bị dự án vào ngày 24/02. Cuộc họp tổng kết với Bộ NN&PTNT và Bộ TN&MT đã được tổ chức vào ngày 04/03/2015 và các hạng mục công việc đã được thống nhất. Lịch trình và phạm vi dự án đề xuất phản ánh các cuộc thảo luận của 2 đoàn giám sát với chính phủ và địa phương được trình bày dưới đây, và các kết quả đi thực địa được trình bày trong Phụ lục 3.

II. Đề xuất dự án

Dự án Đồng bằng sông Cửu Long kết hợp thích ứng biến đổi khí hậu và sinh kế bền vững(P153544) được xem là giai đoạn đầu tiên trong chương trình dài hạn của Ngân hàng về xây dựng khả năng thích ứng với biến đổi khí hậu tại các vùng miền, tăng cường kết hợp lập kế hoạch dài hạn ở các cấp thể chế và nâng cao sinh kế cho cộng đồng đang phải đối mặt với tác động của khí hậu và phát triển. Cụ thể, dự án sẽ hỗ trợ hệ thống thông tin, tổ chức thể chế và lộ trình cho xây dựng năng lực lập kế hoạch cấp tỉnh cho phát triển bền vững khu vực Đồng bằng. 1 phần thiết yếu của đề xuất dự án sẽ xác định kênh liên lạc của đầu tư “ít hối tiếc” trong dự án và các giai đoạn sau này bao gồm cả các

biện pháp công trình và phi công trình. Dự án đang thực hiện “Hỗ trợ kỹ thuật Đồng bằng sông Cửu Long” (P149017) sẽ cung cấp các đầu vào cần thiết cho thiết kế và nội dung dự án đề xuất này.

Dự án được đề xuất thực hiện trong 6 năm với nguồn vốn 300 triệu USD từ IDA và dự kiến 30 triệu USD từ Chính phủ). Các đối tác khác đã bày tỏ sự hỗ trợ mạnh mẽ và mong muốn đồng tài trợ cho dự án này.

Đề xuất Mục tiêu phát triển dự án (PDO) là nhằm nâng cao kết hợp quản lý khả năng thích ứng với biến đổi khí hậu và phát triển Đồng bằng sông Cửu Long tại Việt Nam thông qua nâng cao hệ thống thông tin, tăng cường năng lực và phối hợp thể chế, và tài trợ đầu tư “ít hối tiếc” tại các tỉnh được lựa chọn.

Ý tưởng dự án và phương pháp tiếp cận xây lên từ tầm nhìn trong Quy hoạch ĐBSCL, qua đó vùng đồng bằng được coi như ba vùng thủy sinh thái cắt ngang các tỉnh và các ngành (Xem hình 1). Trong quá trình xác định phạm vi của dự án đề xuất và tham vấn Hội nghị bàn tròn về ĐBSCL, nhóm công tác đặt trọng tâm vào sự phối hợp với các dự án khác của Ngân hàng, cũng như sự phối hợp với các đối tác phát triển khác nhằm đảm bảo tính hiệp trợ.

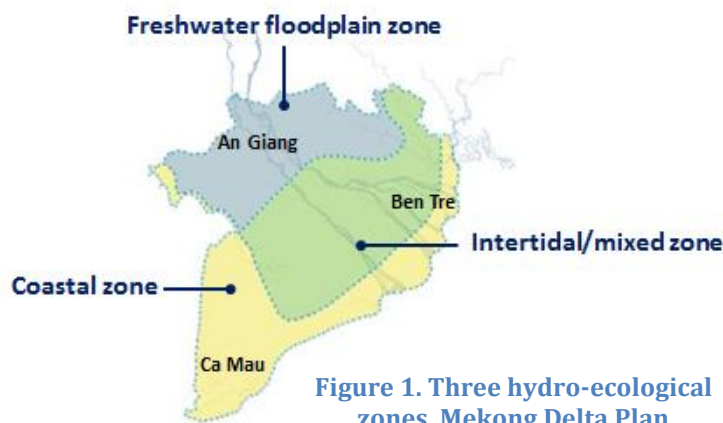


Figure 1. Three hydro-ecological zones, Mekong Delta Plan

Trong quá trình xác định phạm vi của dự án đề xuất và tham vấn Hội nghị bàn tròn về ĐBSCL, nhóm công tác đã đặt trọng tâm vào sự phối hợp với các dự án khác của Ngân hàng, cũng như sự phối hợp với các đối tác phát triển khác nhằm đảm bảo tính hiệp trợ. Các đối tác phát triển đã bày tỏ sự ủng hộ mạnh mẽ cho dự án này và quan tâm đến việc đồng tài trợ.

Dự án có thể bao gồm các Hợp phần chính dưới đây:

Hợp phần 1: Thông tin và thể chế. Hợp phần này nhằm cung cấp khung thể chế và thông tin tổng hợp cho việc lập kế hoạch đa ngành hiệu quả và quản lý ĐBSCL để (i) tăng cường khả năng phục hồi các rủi ro khí hậu và phát triển, nâng cao sức mạnh tổng hợp giữa các bên liên quan ở các tỉnh đồng bằng, (ii) nâng cao việc sử dụng hiệu quả công cụ giám sát hiện đại và công nghệ thông tin để phân tích kịch bản quy hoạch và hoạt động, và đưa ra các quyết định đầu tư, và (iii) xây dựng năng lực cho cách tiếp cận đa ngành. Hợp phần này sẽ xây dựng trên thể chế, năng lực và công cụ hiện có và có thể bao gồm các tiểu hợp phần dưới đây:

Tiểu hợp phần 1.1: Hỗ trợ thông tin và Quy hoạch. Tiểu hợp phần này nhằm tăng cường giám sát, phân tích, truy cập và sử dụng kiến thức cơ bản liên quan về ĐBSCL. Các hoạt động liên quan đến thông tin có thể bao gồm: (i) cung cấp hệ thống giám sát và tổng hợp thông tin, (ii) xây dựng một nền tảng kiến thức cơ sở toàn diện về ĐBSCL, (iii) mở rộng Khung Hỗ trợ quyết định về ĐBSCL thành Hệ thống hỗ trợ quyết định cho việc lập kế hoạch đầu tư, dự báo và quản lý hoạt động thời gian thực, (iv) nhằm mục tiêu nghiên cứu kỹ thuật và khảo sát liên quan đến tính dễ tổn thương và khả năng phục hồi với khí hậu của các đầu tư ngành, khảo sát chi tiết về địa hình, nước ngầm, và chất lượng nước, và (v) cải thiện Quy hoạch tổng thể ĐBSCL nhằm đảm bảo tính hiệp trợ với các kế hoạch của quốc gia, của tỉnh và của các ngành khác.

Tiểu hợp phần 1.2: Tăng cường thể chế và Phát triển chính sách. Các hoạt động liên quan đến xây dựng năng lực thể chế có thể bao gồm: (i) hỗ trợ kỹ thuật để tăng cường thể chế và phát triển chính sách về quản lý khả năng phục hồi và phát triển ĐBSCL, (ii) xây dựng Trung tâm ĐBSCL, một trung tâm hiện đại bậc nhất mà cho phép sử dụng hiệu quả nền tảng kiến thức về ĐBSCL và các công cụ phân tích, cung cấp không gian làm việc tích hợp hợp giữa các bộ/sở, các đại diện tỉnh và các cơ quan nghiên cứu, (iii) các chương trình đào tạo và phát triển chuyên nghiệp, cũng như các khoản tài trợ cho những nghiên cứu có mục đích, và (v) các quỹ cho hiện đại hóa văn phòng.



Figure 2: Visualization of Mekong Delta Center

Hợp phần 2: Cải thiện quản lý nước ngọt thông qua ngăn lũ ở thượng nguồn ĐBSCL (An Giang/Đồng Tháp)

Hợp phần này nhằm tăng cường khả năng phục hồi của kinh tế nông nghiệp và nuôi trồng thủy sản của tỉnh An Giang/Đồng Tháp bằng cách (i) tăng cường quản lý tài nguyên nước và các biện pháp ngăn lũ; (ii) hỗ trợ hệ thống nông nghiệp/nuôi trồng thủy sản bền vững thích nghi và linh hoạt với lũ theo mùa; và (iii) nâng cao khả năng kết nối thị trường và tính cạnh tranh để cải thiện sinh kế. Hợp phần này sẽ đảm bảo sự liên kết và bổ sung với các đầu tư trong các dự án hiện tại/sắp tới của WB (VN SAT, và Tài nguyên nước ĐBSCL) và các dự án khác (GIZ/ DFAT, IUCN) ở tiểu vùng này. Dưới đây là đề xuất các tiểu hợp phần:

Tiểu hợp phần 2.1: Nâng cao quản lý tài nguyên nước và Ngăn lũ. Tiểu hợp phần này sẽ tài trợ các đầu tư mềm và cứng để nâng cao năng lực quản lý tài nguyên nước và các biện pháp ngăn lũ tiềm ẩn ở An Giang/Tứ giác Long Xuyên. Thông qua mô hình thủy văn qua TA Mekong hiện có sẽ giúp ước đoán được các tác động tiềm ẩn về giảm rủi ro lũ ở các thành phố hạ lưu của Long Xuyên và Cần Thơ.



Figure 3: AnGiang field visit (left) and An Giang PPC meeting (right)

Tiểu hợp phần 2.2: Hỗ trợ hệ thống nông nghiệp/thủy sản thích ứng và linh hoạt. Tiểu hợp phần này nhằm mở rộng quy mô các hệ thống nông nghiệp/thủy sản thích ứng và linh hoạt với lũ theo mùa và tăng cường chuỗi giá trị nông nghiệp/thủy sản để hỗ trợ các hoạt động sinh kế bền vững (bao gồm cả giảm rủi ro bệnh tật, tăng năng suất và chất lượng sản xuất). Các hoạt động có thể bao gồm (i) các đầu tư công trình và phi công trình để mở rộng quy mô canh tác lúa nổi và mô hình đa dạng hóa nông nghiệp/nuôi trồng thủy sản (bao gồm các hoạt động xây dựng năng lực và khuyến nông); và (ii) tăng cường các chuỗi giá trị (liên kết nông dân và doanh nghiệp nông nghiệp)

Hợp phần 3: Cân bằng Sinh kế nước ngọt và nước lợ tại Cửa sông của vùng đồng bằng (Bến Tre, Trà Vinh)

Hợp phần này nhằm giải quyết những thách thức liên quan đến xâm nhập mặn, xói lở bờ, và cải thiện sinh kế cho các cộng đồng sinh sống ven biển và các vùng cửa sông thông qua (i) các biện pháp bảo vệ vùng ven biển chống lại lũ lụt và xói lở bờ, và bảo vệ các hoạt động kinh tế nội địa; (ii) các đầu tư quản lý tài nguyên nước ở cả các hệ thống đóng và mở; (iii) xây dựng năng lực phục hồi và thích ứng với tiến trình xâm nhập mặn đang lấn sâu bằng cách đa dạng hóa hệ thống nông nghiệp/thủy sản; và (iii) đảm bảo cung cấp nước ngọt cho sinh hoạt/thương mại ở các vùng chuyên tiếp và vùng ven biển. Hợp phần này sẽ đảm bảo sự liên kết và bổ sung với các đầu tư thuộc các dự án hiện tại/sắp tới của WB (Tài nguyên nước ĐBSCL) và các dự án khác (JICA, IFAD) trong tiểu vùng này. Hợp phần này dự kiến bao gồm các tiểu hợp phần sau:

Tiểu hợp phần 3.1: Bảo vệ bờ biển/phục hồi – Hợp phần này nhằm phục hồi cảnh quan bờ biển để nâng cao khả năng phục hồi hệ thống canh tác nội địa, giảm tình trạng dễ bị tổn thương với các tác động của nước biển dâng và xói lở. Các hoạt động có thể bao gồm (i) trồng rừng ngập mặn ở các khu vực có mục tiêu.

Tiểu hợp phần 3.2: Cải thiện quản lý nguồn nước: Tiểu hợp phần sẽ đầu tư cho công trình phân cứng và phân mềm để đóng góp cho cả hệ thống đóng và mở, ra quyết định ở các khu vực và sẽ phù hợp hơn khi các vùng nước ngọt dành cho lúa và cây ăn trái/vườn cây ăn trái, và những khu vực phù hợp cho phát triển kinh tế nước lợ. Các phương án cần xem xét có thể bao gồm cống có cửa, bờ bao sông, cảng sông, vùng trữ nước ngọt, v.v.

Tiểu hợp phần 3.3: Hỗ trợ các hệ thống nông nghiệp/thủy sản thích ứng và phục hồi với điều kiện xâm nhập mặn. Hợp phần này nhằm mục đích cải thiện khả năng bền vững của nuôi tôm và khuyến khích luân canh/đa dạng hóa các hệ thống canh tác thông qua (i) áp dụng GAP/BMP trong các hệ thống nuôi tôm, (ii) hỗ trợ đa dạng hóa nông nghiệp/thủy sản phi nuôi tôm có giá trị cao; và (iii) hỗ trợ kỹ thuật để tăng cường lập kế hoạch ngành tổng hợp.

Tiểu hợp phần 3.4: Cải thiện sinh kế ven biển. Tiểu hợp phần này nhằm tăng cường các chuỗi giá trị để hỗ trợ các chương trình sinh kế bền vững.

Hợp phần 4: Thích ứng với xói lở ven biển và xâm nhập mặn (Cà Mau, Bạc Liêu)

Hợp phần này nhằm mục đích tăng cường thích ứng với biến đổi khí hậu của kinh tế nước lợ của tiểu vùng Nam Cà Mau bằng cách (i) khôi phục hệ sinh thái để giảm xói mòn ven biển và bảo vệ các hoạt động kinh tế nội vùng; (ii) tăng cường năng lực phục hồi và thích ứng với quá trình mở rộng dần của xâm nhập mặn do nước biển dâng gây ra thông qua việc ứng dụng các hệ thống canh tác thủy sản/nông nghiệp đa dạng; và (iii) phát triển/ cải thiện sinh kế ven biển phù hợp (nghĩa là, cải thiện cả năng lực kết nối và tính cạnh tranh trong thị trường). Hợp phần này sẽ đảm bảo theo hướng và bổ sung với các biện pháp đầu tư trong các dự án của WB hiện tại/sắp tới (Dự án thủy lợi đồng bằng sông Cửu Long, dự án CRSD) và các dự án khác (GIZ-ICMP, IUCN, ADB) trong tiểu vùng này. Hợp phần này dự kiến bao gồm những tiểu hợp phần sau:

Tiểu hợp phần 4.1: Khôi phục hệ sinh thái – Hợp phần này nhằm mục tiêu khôi phục tính đa dạng sinh thái để tăng cường khả năng phục hồi lại các hệ thống canh tác nội đồng, giảm khả năng dễ bị tổn thương tới các tác động do nước biển dâng và xói mòn ven bờ. Các hoạt động có thể bao gồm (i) hỗ trợ kỹ thuật cho các hệ thống canh tác sinh thái và (ii) khôi phục rừng ngập mặn ở những vùng mục tiêu.

Tiểu hợp phần 4.2: Hỗ trợ các hệ thống nông nghiệp/ thủy sản thích ứng và ứng phó với xâm nhập mặn. Hợp phần này nhằm mục tiêu tăng cường tính bền vững trong nuôi tôm và khuyến khích luân canh/đa dạng hóa các hệ thống canh tác thông qua (i) áp dụng GAP/BMP trong các hệ thống nuôi tôm, (ii) hỗ trợ đa dạng hóa nông nghiệp/thủy sản phi nuôi tôm có giá trị cao; và (iii) hỗ trợ kỹ thuật để tăng cường lập qui hoạch ngành tổng hợp.

Tiểu hợp phần 4.3: Cải thiện sinh kế ven biển. Tiểu hợp phần này nhằm mục tiêu tăng cường chuỗi giá trị thủy sản/nông nghiệp nhằm hỗ trợ các chương trình sinh kế bền vững. Các hoạt động có thể bao gồm (i) đầu tư vào hạ tầng phục hồi để tạo điều kiện thực hiện các sáng kiến canh tác bền vững và cải thiện sinh kế vùng ven biển và (ii) tăng cường các chuỗi giá trị và các bên liên quan.

Hợp phần 5: Quản lý dự án, giám sát và đánh giá

Hợp phần này sẽ bao gồm các chi phí vận hành gia tăng, dịch vụ tư vấn và cố vấn cho quản lý dự án chung, quản lý tài chính, đấu thầu, chính sách an toàn và giám sát và đánh giá.

III. Chính sách an toàn

Tác động môi trường chung từ các hoạt động đề xuất dự kiến phần lớn là tác động tích cực. Các công trình đầu tư tiềm năng làm tăng độ che phủ của rừng ngập mặn sẽ làm giảm xói lở ven bờ, là phần bảo vệ ruộng và làng mạc nằm trong những khu vực ven bờ nhạy cảm. Việc ứng dụng canh tác lúa nổi hữu cơ cho thấy làm giảm phát thải khí nhà kính.

Trong khi các hoạt động đầu tư chủ yếu của Dự án vẫn chưa xác định nhưng sẽ yêu cầu có các biện pháp giảm thiểu cho các tác động môi trường có thể phát sinh do kết quả thực hiện các tiểu dự án điển hình như sau:

- a. Tăng tải lượng ô nhiễm trong đất và nước do mở rộng nuôi tôm thâm canh và sử dụng thuốc trừ sâu và phân bón trên rau màu gieo trồng vì là nguồn lợi ích bổ sung trong điều kiện ứng dụng canh tác lúa nổi.
- b. Thay đổi dòng chảy sinh thái của sông Cừ Long do xây lắp các công trình hạ tầng kiểm soát lũ/ nước tiềm năng và các biện pháp công trình khác như vậy; và những thay đổi về tính đa dạng và khối lượng quần thể cá¹ do kết quả của các biện pháp này.
- c. Tồn tại vật liệu chưa nổ ở vùng đồng bằng sông Cừ Long cần có chương trình rà phá bom mìn trước khi bắt đầu công tác xây dựng, và tất cả công nhân đảm đương công tác nạo vét phải được thực hiện công việc có các biện pháp bảo hộ phù hợp.
- d. Tất cả vật liệu nạo vét phải được thử nghiệm về đất chua phèn, phải được xử lý và đổ thải an toàn.

Xét về các tác động xã hội, có thể cần phải bồi thường cho các cộng đồng sở tại do mất nhà, tài sản không lưu động, và/hoặc mất thu nhập/ sinh kế do kết quả của việc thực hiện các biện pháp kiểm soát lũ/ngăn mặn hoặc thay đổi về thực tiễn đánh bắt hoặc nuôi thả và/hoặc thay đổi canh tác. Điều quan trọng là phải đánh giá tác động của các tiểu dự án dự kiến tới các cộng đồng thiểu số và dễ bị tổn thương, đảm bảo rằng các tiểu dự án mang lại lợi ích cho phụ nữ, thanh niên và những người bị thiệt hại thực tế. Nếu những thay đổi tiềm tàng về thực hành canh tác/ mùa vụ thì cần phải có các biện pháp bảo vệ xã hội hoặc các phương thức sinh kế tạo thu nhập thay thế để bù đắp những thiệt hại về thu nhập trong các cộng đồng bị tác động.

¹ Các loài cá trong vùng đồng bằng sông Cừ long (đặc biệt là các loài cá da trơn) đang bị đe dọa do đánh bắt quá mức và do mất môi trường sinh sống và khu vực đẻ trứng do những thay đổi trên sông, kể cả do xây dựng đập dâng, làm kênh hóa bờ sông, xây dựng cảng và nổ mìn. Phát triển hạ tầng cũng gây chặn đường di cư và ngăn cách một số quần thể cá.

Nếu các tiêu hợp phần đầu tư sẽ tài trợ trong dự án dẫn tới các vấn đề môi trường xấu hoặc các tác động xã hội lớn và/hoặc không thể thay đổi thì khi đó dự án sẽ được xếp loại trong Nhóm A – là dự án chắc chắn sẽ có tác động môi trường xấu lớn là những tác động nhạy cảm, đa dạng hoặc chưa từng xảy ra. Sổ tay về An toàn xã hội của Ngân hàng OP4.01, Đánh giá môi trường: OP 4.04, Môi trường sống tự nhiên; OP4.36, Rừng; OP4.09, Quản lý sâu bệnh; OP4.11, Tài nguyên văn hóa vật thể; OP4.10, Người bản địa, và OP4.12, Tái định cư bắt buộc, chắc chắn sẽ được kích hoạt. Vì dự án nằm trong vùng đồng bằng sông Cửu Long, và có thể có các biện pháp kiểm soát lũ và các biện pháp quản lý nước khác nên có thể có tác động tới vùng ven sông, OP7.50-Đường nước quốc tế - chắc chắn sẽ được kích hoạt, và cần phải thực hiện thông báo cho các quốc gia ven sông (hoặc sẽ tìm kiếm hình thức miễn trừ) trước khi phê duyệt dự án.

Các tác động cục bộ, xã hội của các tiểu dự án khác nhau sẽ được xác định qua quá trình sàng lọc về các tác động môi trường và xã hội. Quá trình này sẽ được định hướng trong hồ sơ tài liệu chính sách an toàn khung là tài liệu sẽ dùng để hướng dẫn khi lập Đánh giá môi trường của tiểu dự án cho những dự án chưa được xác định rõ trước khi thẩm định dự án. Do tính chất vùng của dự án và các tác động liên ngành của nó, có thể phải thực hiện đánh giá tác động lũy kế. Sẽ thực hiện tham vấn với các bên liên quan ở địa phương trong khi chuẩn bị tài liệu môi trường.

IV. Tổ chức thể chế

Dự kiến sẽ thiết kế Dự án mang tính đa ngành và do đó, sẽ yêu cầu sự tham gia của cả bộ TNMT cũng như của bộ NN&PTNT cùng với sự tham gia tích cực của các tỉnh đã chọn. Nhóm công tác của Ngân hàng đã có một số buổi thảo luận với chính phủ, kể cả cuộc ăn tối và làm việc cấp cao với các Bộ trưởng của cả hai bộ và cuối cùng đã thống nhất với Chính phủ về bố trí như sau:

Bộ TNMT: Với chức năng điều phối các chương trình về biến đổi khí hậu quốc gia, Bộ TNMT sẽ là Cơ quan chủ quản cấp trung ương (Chủ dự án) chịu trách nhiệm về điều phối chung và lập dự án. Dưới sự hướng dẫn của Ủy ban về Biến đổi khí hậu quốc gia (NCCC) do Bộ TNMT chỉ đạo, sẽ thành lập tổ chuẩn bị dự án đa bộ (PPT) cùng với bộ máy nhân sự tối thiểu², do Vụ HTQT của Bộ TNMT chỉ đạo để phối hợp với Bộ NN&PTNT và các tỉnh trong khi chuẩn bị dự án. Nhóm đã cố vấn cho Bộ TNMT để lấy cán bộ từ các cơ quan nghiên cứu của bộ, đặc biệt là IMHEN, là một bộ phận của PPT chủ chốt.

Bộ NN&PTNT: Bộ NN&PTNT và các tỉnh phải lập và sau đó thực hiện phần quan trọng của dự án đầu tư dự kiến. Vụ HTQT của Bộ NN&PTNT sẽ thành lập và chỉ đạo một Tổ chuẩn bị dự án của Bộ NN&PTNT, có bộ máy nhân sự tối thiểu, có tất cả các cục/vụ liên quan tham gia như thủy lợi, trồng trọt, lâm nghiệp và thủy sản. Tổ chuẩn bị dự án đã tư vấn cho Bộ NN&PTNT lấy cán bộ từ các cơ quan nghiên cứu của bộ, Viện KHTL miền Nam và viện QHTL miền Nam, là một bộ phận của PPT chủ chốt. PPT chịu trách nhiệm làm việc và điều phối với bộ TNMT để hướng dẫn, kiểm tra và thẩm định các đề xuất đầu tư do các tỉnh lập.

Các tỉnh: Dự án sẽ được thiết kế theo hình thức phân giai đoạn, có các công trình đầu tư ban đầu ở cả ba tiểu vùng mục tiêu, đó là, vùng thượng nguồn (lũ đồng bằng, tập trung ở tỉnh An Giang và Đồng Tháp), vùng cửa sông (vùng xâm nhập triều, tập trung vào Bến Tre và Trà Vinh) và vùng bán đảo (vùng ven biển, tập trung vào Cà Mau và Bạc Liêu). Tương tự như cấp trung ương, dự án sẽ lấy ý kiến hướng dẫn của Ủy ban Biến đổi khí hậu cấp tỉnh (PCCC) bao gồm các thành viên của các sở liên quan như Sở TNMT, sở NN&PTNT, sở XD, v.v. Dưới UBND tỉnh, cần thành lập PPT bao

² Tổ chuẩn bị dự án cần có Giám đốc dự án, Phó giám đốc dự án, 2-3 cán bộ kỹ thuật (trong đó có chuyên gia về chính sách an toàn). PPT cần tham vấn với nhóm rộng hơn có đại diện của các cục/vụ của Bộ TNMT, bộ NN&PTNT.

gồm tất cả các sở/ chi cục liên quan và các cơ quan đề cùng làm việc và đưa ra các đề xuất đầu tư tương ứng. Nếu phù hợp, khuyến khích các tỉnh sử dụng Ban QLDA có sẵn của tỉnh đang quản lý các dự án do NHTG đầu tư.

V. Tình hình chuẩn bị và thời gian dự kiến

Nhóm công tác đã xem xét dự án Đề xuất dự án (PO) và ghi nhận kết quả làm việc vất vả của Bộ TNMT và các cơ quan liên quan. Đã thống nhất rằng Nhóm công tác của Ngân hàng sẽ góp ý, trong đó có cả sự cần thiết phải tham vấn với Bộ NN&PTNT về PO. Bộ TNMT sau đó sẽ hoàn thiện PO và trình đề phê duyệt. Nhóm công tác của Ngân hàng cũng tư vấn cho cả Bộ TNMT và Bộ NN&PTNT để cùng làm việc với các nhóm chuẩn bị dự án của các bộ (như đã nêu bên trên).

Nhóm công tác tư vấn là Bộ TNMT, Bộ NN&PTNT và các tỉnh phải xác định và khẳng định vốn đối ứng có sẵn trong năm 2015 cho phần chi phí chuẩn bị dự án, kể cả khảo sát thực địa, thiết kế kỹ thuật chi tiết cho hệ thống công trình hạ tầng, phát triển nghiên cứu khả thi, lập tài liệu chính sách an toàn, v.v. Đoàn cũng đã đề nghị Bộ TNMT và bộ NN&PTNT giao cán bộ chuyên trách từ các cơ quan nghiên cứu liên quan của bộ (IMHEN, SIWRP, SIWRR) để tạo thành các tổ chuẩn bị dự án chủ chốt. Nhóm công tác của Ngân hàng cũng đưa ra các hướng dẫn kỹ thuật và hỗ trợ cho các PPT khi cần thiết.

Dự kiến đoàn tiếp theo sẽ là Đoàn chuẩn bị dự án, kế hoạch làm việc từ ngày 30/3 tới ngày 06/4/2015. Đoàn này sẽ đi thực địa ở các tỉnh đã chọn cũng như thảo luận kỹ thuật với các đối tác chính phủ tại bộ TNMT, bộ NN&PTNT và các cơ quan có thẩm quyền ở tỉnh.

Dự kiến Kế hoạch chuẩn bị dự án:

	Vấn đề/ Biện pháp/Action	Trách nhiệm	Thời hạn
1	<u>Xác định dự án</u> <ul style="list-style-type: none"> • Đoàn phối hợp xác định dự án • Lập Tài liệu dự án đề xuất; có ý kiến phê duyệt • Lập Đề xuất dự án; có ý kiến phê duyệt 	GOV/Ngân hàng Ngân hàng MONRE/MARD/ Tư vấn	Dec 14 -Feb 15 Mar 31, 2015 Mar 31, 2015
2	<u>Chuẩn bị dự án</u> <ul style="list-style-type: none"> • Thành lập Tổ chuẩn bị dự án (PPT) của MONRE/MARD/tỉnh dự án. • Lập đề xuất đầu tư cho các hợp phần/ tiểu hợp phần. <ul style="list-style-type: none"> - <i>Xác định/lựa chọn hệ thống đầu tư ít hối tiếc</i> - <i>Thiết kế kỹ thuật cho các hệ thống đã lựa chọn (30% gói công trình).</i> - <i>Thiết kế các hoạt động đầu tư chính khác</i> - <i>Lập tài liệu về an toàn xã hội và môi trường (nghĩa là RAF, RAPs, ESMF, EAs, v.v.).</i> • Lập PDO và có ý kiến phê duyệt 	MONRE/MARD/Tỉnh MONRE /MARD/ Tỉnh/Tư vấn	Mar 31, 2015 April-Sep 2015 April 30, 2015 May –Aug 2015 May – Aug 2015 May -Sep2015 Sep 30, 2015
3	<u>Thẩm định</u> <ul style="list-style-type: none"> • Tiền thẩm định • Thẩm định • Lập FS và có ý kiến phê duyệt 	Ngân hàng Ngân hàng MONRE/MARD/Tư vấn	Sep 2015 Oct 2015 Nov 2015
4	<u>Đàm phán</u> <ul style="list-style-type: none"> • Mời đàm phán 	Ngân hàng	Dec 2015

	Vấn đề/ Biện pháp/Action	Trách nhiệm	Thời hạn
	• Đàm phán	SBV/Ngân hàng	Feb 2016
5	<u>Phê chuẩn</u> • Ban lãnh đạo NH phê chuẩn • Chính phủ Việt Nam phê chuẩn	Ngân hàng GOV	Mar 2016 April 2016
6	<u>Ký kết hiệp định</u>	SBV/Ngân hàng	June 2016
7	<u>Thực hiện</u>	MONRE/MARD/Tỉnh	July 2016

Annex 1: List of Persons Met

MONRE:

Pham Phu Binh, Director General, ICD, MONRE
Do Nam Thang, Deputy Director General, ICD, MONRE
Pham Vinh Phong, Deputy Division Head, DHMCC, MONRE
Le Minh Nhat, Head of Climate Change Adaptation Division, DHMCC, MONRE
Tran Phuong, NCCC Standing Office, MONRE

MARD:

Hoang Van Thang, Vice Minister, MARD
Tran Kim Long, Director General, ICD, MARD
Nguyen Hai Long, Official, ICD, MARD
Nguyen Thanh Dam, Division Head, ICD, MARD
Nguyen Xuan Hien, Director, Southern Institute of Water Resources Planning (SIWRP),
Tang Duc Thang, Dep. Director, Southern Institute of Water Resources Research (SIWRR)
Nguyen Hong Phuong, Deputy Director, Irrigation CPO, MARD
Nguyen Dinh Hau, Irrigation CPO, MARD
Bui Huy Binh, Irrigation CPO, MARD

MPI:

Tran Thien Son, Official, Department of Agricultural Economics, MPI

Ca Mau PPC:

Le Dung, Vice Chairman, Ca Mau PPC
Le Van Su, Director, Ca Mau DARD
To Quoc Nam, Deputy Director, Ca Mau DARD
Nguyen Van Ba, Director, Ca Mau DONRE
Tran Van Tam, Deputy Director, Ca Mau DPI
Duong Hoai Nam, Director, Ca Mau DOT
Doan Quoc Khoi, Deputy Director, Ca Mau DOF
Nguyen Van Quan, Vice Chief Administrator, Ca Mau PPC
Nguyen Thanh Tung, Sub-Department of Irrigation, Ca Mau DARD
Nguyen Vinh Sang, Director, Ca Mau PPMU

An Giang PPC:

Le Van Nung, Vice Chairman, An Giang PPC
Do Vu Hung, Director, An Giang DARD
Nguyen Trong Thanh, Deputy Director, An Giang DONRE
Ngo Cong Thuc, Deputy Director, An Giang DOT
Pham Thanh Nhon, Deputy Director, An Giang DPI
Thai Thuy Xuan, Deputy Chief Administrator, An Giang PPC Office
Ly Thi Thanh Huyen, Deputy Division Head, An Giang PPC Office
Hua Quang Lap, Division Head, An Giang DARD
Ly Huynh Nhat Tien, Division Deputy Head, An Giang DARD
Tran Che Linh, Official, An Giang DARD
Tran Chau Phuong Tuan, Deputy Director, Sub-department of Fisheries, An Giang DARD
Le Van Hoang, Deputy Director, Sub-department of Forest Protection, An Giang DARD
Vuong Manh Tien, Division Deputy Head, Sub-department of Irrigation, An Giang DARD
Mai Van Lap, Deputy Director, Sub-department of Irrigation, An Giang DARD
To Hoai Phong, Deputy Director, PPMU, An Giang DARD
Huynh Van Thai, Deputy Director, Sub-dept Environment Protection, An Giang DONRE

Vo Thanh Xuan, Official, Sub-department of Environment Protection, An Giang DONRE
Chau Rom Qui Rut, Official, An Giang DPI
Vuong Thoai Trung, An Giang Representative Office, Vienam News Agency
Ngo Chuan, An Giang Newspaper

Ben Tre PPC:

Cao Van Trong, Vice Chairman, Ben Tre PPC
Cao Van Viet, Deputy Director, Ben Tre DARD
Doan Van Phuc, Deputy Director, Ben Tre DONRE
Duong Van Phuc, Deputy Director, Ben Tre DPI
Officials from Ben Tre PPC Office

GIZ:

Christian Henckes, Director, Integrated Coastal Management Programme (ICMP), GIZ
Benjamin Hodick, Sr Technical Advisor, ICMP, HCMC office, GIZ
Doan Thi My Hoa, Programme Officer, ICMP, An Giang office, GIZ

DFAT:

Nguyen Thanh Vinh, DFAT, Australian Embassy in Vietnam
Nguyen Quoc Viet, DFAT, Australian Embassy in Vietnam

IUCN:

Andrew Wyatt, Mekong Delta Program Manager, Building Coastal Resilience (BCR) project

World Bank team:

Iain Shuker (Practice Manager, ENR)
Anjali Acharya (Sr. Environmental Specialist, TTL)
Greg Browder (Lead Water Resources Specialist, co-TTL)
Cao Thang Binh (Sr. Agriculture Specialist, co-TTL)
Nguyen Thi Le Thu (Environmental Specialist, Climate Change)
Nagaraja Rao Harshadeep (Sr. Environmental Specialist, Water Resources)
Noreen Beg (Sr. Environmental Specialist, Safeguards)
Roxanne Hakim (Sr. Anthropologist)
Dinh Thu Quyen (Program Assistant)
Vansa Chatikavanij (consultant, water resources)
Martijn van de Groep (consultant, delta management)
Pierre Arnoux (consultant, social safeguards)

Annex 2: Mission Agenda

Identification Mission

Date	Time	Activities
Wed (11/26)	9am - 12pm	Kickoff meeting (full team)
	2pm - 5pm	Meeting with ICEM : TA links to the project design
Thu (11/27)	1:30pm- 5:30pm	Review proposed projects from MARD, MONRE, provinces.
Fri (11/28)	8am - 10am	Technical meetings with MARD on proposed components
	11:30am - 1:30pm	Working lunch with Fons Nelen (on 3Di modelling)
Sat (11/29)	11:30am- 1:30pm	Victoria meeting with MONRE VM Ha
Sun (11/30)	1:30pm	Fly to Can Tho (overnight in Can Tho)
Mon (12/1)	Morning	Drive to Ca Mau
	Afternoon	Discussion (1) with Ca Mau PPC (overnight in Ca Mau)
Tue (12/2)	Morning	Field visits in Ca Mau
	Afternoon	Discussion (2) with Ca Mau PPC (overnight in Ca Mau)
Wed (12/3)	Morning	Drive to An Giang (overnight in AG)
	Afternoon	Meeting with An Giang PPC
Thu (12/4)	Morning	Field visits in An Giang
	Afternoon	Drive back to Can Tho
Fri (12/5)	7:30-8:30am	Meeting with the SWSC
	10:25am	Fly back to Hanoi in the morning
	2pm - 4pm	Technical meetings with MONRE on proposed components

Technical Mission

Date	Time	Activities
Tue (2/3)	4:30 pm – 5:30 pm	Meeting with Ca Mau PPC
Wed (2/4)	7:00 am – 1:00 pm	Site visit to Ben Tre
	2:00 pm – 4:00 pm	Meeting with Ben Tre PPC
Thu (2/5)	8: 30 am – 11:00 am	Meeting with An Giang PPC
	11:00 am – 1:00 pm	Internal wrap-up meeting

Annex 3: Field Observations

Context

The Mekong Delta is critical for the development of Vietnam and also for regional food security; the Delta produces 50% of Vietnam's rice (90% for export) and 70% of its aquaculture products. The wetlands and estuaries of the Delta are important sources of biodiversity. In recent decades, the region is experiencing rapid socio-economic changes with increases in agricultural and aquaculture production, and greater liberalization and diversification of rural markets.

A number of natural and anthropogenic changes are placing significant development pressures on the Mekong Delta. Coastal erosion, groundwater over-abstraction, salinization of the soil and flooding in the upstream provinces already pose adverse economic consequences, while climate change is expected to further threatens lives, livelihoods and assets.

Through consultation with key stakeholders, the mission confirmed that an integrated, resilient, sustainable development and management of the Mekong delta across spatial perspectives (e.g. provinces, districts), sectoral perspectives (e.g. agriculture, water resources, environment, transport), and development goals (e.g. economic, social, environmental) is needed. Working in partnership with the GoV, the World Bank's team is preparing an investment operation that brings together information, institutions, and investments together to lay the groundwork for long-term integrated resilient solutions in the Mekong Delta.

Information

Information platforms play key roles to support resilient planning and management of the highly vulnerable Mekong Delta; it provides a basis in which to develop a shared vision across the key national, provincial, and local organizations, and to build the knowledge and institutional foundation to plan and manage existing and future investments. During the missions, various government stakeholders identified the need for greater integration across delta provinces, as well as the need to modernize the planning and management of multi-sectoral delta development through improved use of modern monitoring, telemetry, data analysis, visualization, knowledge product development and dissemination platforms.

Institutions

Addressing issues in the delta requires an integrated shared-vision approach across relevant institutions. One of the most pressing shortcomings in the Mekong Delta climate resilience development is observed as the limited coordination amongst the government agencies (within and across national and provincial levels) to plan and implement reforms. The Provincial People's Committees (PPCs) mandate spans within their respective province with no mechanism or incentive to coordinate across provinces, which would be necessary for implementing integrated development approaches. While official mandate exist at the Central level, it is difficult for one Ministry to lead for the coordination of a large-scale integrated effort in practice. Finally, the current mandate limits the South-West Steering Committee (SWSC) from taking a larger coordination role, specifically on implementation of measures and investments. The critical need to improve knowledge networks across relevant institutions (especially government agencies and academia) was also noted.



Figure 5. Meeting with the SWSC (left) and World Bank Mission discussion (right).

Cà Mau Field Visit

The mission visited Cà Mau Province, located in the southernmost province of the Mekong Delta Region (MKD) and with an estimated population of 1.2 million. As one of the lowest lying areas in the world, the Cà Mau peninsula is faced with considerable challenges from sea level rise; saline intrusion; pollution from over-intensive aquaculture farming; coastal erosion caused partly by mangrove destruction; freshwater shortages; seasonal flooding; and land subsidence caused by excessive extraction of ground water.

The Cà Mau Peninsula has undergone an intensive change under the combined pressure of urbanization, and intensification and expansion of aquaculture, horticulture and agriculture activities. In the recent decade, there is a rapid shift from rice farming to more lucrative shrimp and fish farming. There is also increasing recognition of the need for reforestation and mangrove restoration to maintain ecosystem services, and for a change in the water management regime.

The mission noted the current provincial land use plan was prepared 10 years ago and is out of date. With the scarcity of freshwater from the Mekong and unreliable rainfall, the current plan to turn part of Cà Mau province into a freshwater agriculture economy may be challenging. In addition, it would involve extensive infrastructure investments such as in reservoirs, embankment, and sluiceways to collect, retain, and regulate freshwater sources. Anecdotal evidence has shown that rice farming in these ‘artificial’ regions is not productive and often less competitive compared to other sub-regions in the upper part of the MKD.



Figure 6: Cà Mau field visit (left) and Ca Mau PPC meeting (right).

Provincial authorities informed the mission that the model of shrimp-rice rotation, which is a common practice in the area, helps to reduce environmental pollution caused by mono-crops of shrimp, thereby reducing disease risks. However, this could be achieved by other alternatives such as the application of Good Aquaculture Practices (GAP) and Better Management Practices (BMP) rather than heavily investing in infrastructure to change the region to freshwater economy. Also, in

the long term under impact of increased climate change, such changes will fail due to the lack of freshwater especially in years having long drought periods.

Based on the field visits and discussions with Cà Mau PPC, the mission identified the highest priorities for Cà Mau peninsula to include (a) reduction in coastal erosion to protect inland economic activities, (b) building capacity of resilience and adaptation to the gradual expansion process of saline intrusion caused by SLR, and (c) developing /improving coastal livelihoods in a sustainable manner for local farmers.

An Giang/ Long Xuyen Quadrangle Field Visit

The mission visited An Giang Province which is located in the upper part of the MKD, and has an estimated population of 2.15 million. Rice production and fisheries plays an important role in both domestic consumption as well as export. An Giang faces issues of flooding and water shortages in the Mekong River as a result of upstream activities.

Discussions with An Giang PPC highlighted the need to enhance the quality and diversification of agricultural products, reduce chemical and fertilizer inputs based on good agriculture and aquaculture practices, and increased linkages between the local producers and national and international markets. Here, flood retention measures were seen as a potential solution to ensure environmental and social protection, as well as to promote livelihoods security and income generation as it would (a) gradually reduce reliance on triple rice cropping which has been proven to be unsustainable in the long term; and (b) increase soil fertility for post flooding crops and enable more diversification of crop and fish. Additionally, these flood retention measures are expected to reduce downstream flooding in Long Xuan city and Can Tho city.

The mission also visited a GIZ administered pilot project area in An Giang for floating rice-upland vegetable/crops (MARD's ICMP Project funded by DFAT). This pilot demonstrates a promising alternative to triple rice cropping as it does not require the use of pesticide and, thus, the rice straw can be used as mulch for other vegetable or crops during the dry season. In addition, it allows for diversification of crop and/or fish



Figure 7: An Giang floating rice field, GIZ ICMP site

Based on the field visits and discussions with An Giang's PPC, the mission identified the highest priorities for An Giang to include (a) strengthening water resources management and controlled flooding measures, while ensuring environmental and social sustainability; (b) scaling-up of floating rice and diversification of vegetable/crops; and (c) supporting resilience to climate change and co-existence with flood through improving local livelihoods, including connecting production to the markets.

Ben Tre Field Visit

The mission visited Ben Tre Province located in coastal part of the Mekong Delta, which represents an inter-tidal zone where freshwater and saline water interact. Ben Tre's coastline and a large marine zone make it highly vulnerable to the impacts of upstream and climate changes resulting in increased saline intrusion, coastal erosion, extreme weather events and sea level rise. The major livelihoods in Ben Tre include non-rice farming, aquaculture and near shore fishing.

The mission conducted site visit to the coastline and river estuary at Ben Tre. Discussions with local communities revealed rapid coastal erosion in some reason from a combination of various natural forces (e.g. wave actions, wind etc.), as well as unmanaged economic development and removal of mangroves and other coastal vegetation. In recent years, a large area of mangrove forests has been cut to build shrimp ponds and accommodate crop production.



Figure 8. Ben Tre site visits.

Discussions with Ben Tre PPC highlighted the need to enhance adaptation strategies and coping mechanisms of local communities through solutions to control the Delta's salinity gradient in order to optimize agriculture production. Traditionally, dykes have been built to prevent salt water intrusion. However, increasing sea level rise and high tides makes a case to examine a shift from fresh water oriented economy to brackish and/or saline economy.

Based on the field visits and discussions with Ben Tre's PPC, the mission identified the highest investment priorities to include: (a) review of the sectoral master plan to ensure it is consistent with Delta wide master plan, and provide integrated long-term development approach, (b) strengthen water resources management to solve the challenge of salinity intrusion while ensuring environmental and social sustainability, and (c) prevention of coastal erosion through reforestation along the coastline, improve protection of dykes, and promotion of process to improve alluvial ground.

Số: 1693/QĐ-BNN-HTQT

Hà Nội, ngày 09 tháng 5 năm 2016

QUYẾT ĐỊNH

Phê duyệt Báo cáo nghiên cứu khả thi Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững Đồng bằng sông Cửu Long” (ICRSL) do Ngân hàng Thế giới tài trợ.

CÔNG VĂN ĐẾN	
Số: 1693	
Ngày: 09/05/2016	
TRƯỞNG BAN	<input checked="" type="checkbox"/>
PHÓ TRƯỞNG BAN	<input checked="" type="checkbox"/>
THÀNH VIÊN	<input checked="" type="checkbox"/>
PHỤ AN, CV:	<input checked="" type="checkbox"/>
THƯ	<input checked="" type="checkbox"/>

Căn cứ Nghị định số 199/2013/NĐ-CP ngày 26/11/2013 của Chính phủ quy định chức năng, nhiệm vụ, quyền hạn và cơ cấu tổ chức của Bộ Nông nghiệp và Phát triển nông thôn;

Căn cứ Luật Xây dựng số 50/2014/QH13;

Căn cứ các Nghị định của Chính phủ: Số 59/2015/NĐ-CP ngày 18/6/2015 về quản lý dự án đầu tư xây dựng công trình; Số 32/2015/NĐ-CP ngày 25/3/2015 về quản lý chi phí đầu tư xây dựng; Số 46/2015/NĐ-CP ngày 12/5/2015 về quản lý chất lượng và bảo trì công trình xây dựng; Số 78/2010/NĐ-CP ngày 14/7/2010 của Chính phủ về cho vay lại nguồn vốn vay nước ngoài của Chính phủ; Số 38/2013/NĐ-CP ngày 23/4/2013 về Quản lý và sử dụng nguồn hỗ trợ phát triển chính thức (ODA) và nguồn vốn vay ưu đãi của các nhà tài trợ;

Căn cứ Quyết định số 144/QĐ-TTg của Thủ tướng Chính phủ ngày 21/06/1999 về phê duyệt “Quy hoạch về kiểm soát và sử dụng nước lũ vùng ĐBSCL giai đoạn từ nay đến 2010”;

Căn cứ Quyết định số 84/2006/QĐ-TTg của Thủ tướng Chính phủ ngày 19/04/2006 về việc phê duyệt “Điều chỉnh bổ sung Quy hoạch thủy lợi Đồng bằng sông Cửu Long giai đoạn 2006-2010 và định hướng đến 2020”;

Căn cứ Quyết định số 1397/QĐ-TTg của Thủ tướng Chính phủ ngày 25/09/2012 phê duyệt Quy hoạch thủy lợi đồng bằng sông Cửu Long giai đoạn 2012-2020 và định hướng đến năm 2050 trong điều kiện biến đổi khí hậu, nước biển dâng;

Căn cứ văn bản số 1245/VPCP-QHQT ngày 26/02/2014 của Văn phòng Chính phủ về việc triển khai kết quả Kỳ họp lần thứ 3 Ủy ban Liên Chính phủ Việt Nam – Hà Lan;

Căn cứ Quyết định số 667/QĐ-TTg ngày 27/5/2009 của Thủ tướng Chính phủ phê duyệt Chương trình củng cố, nâng cấp hệ thống đê biển từ Quảng Ngãi đến Kiên Giang;

Căn cứ Quyết định số 90/2016/QĐ-TTg ngày 12/01/2016 của Thủ tướng Chính phủ về việc phê duyệt quy hoạch mạng lưới quan trắc Tài nguyên và Môi trường quốc gia giai đoạn 2016-2025, tầm nhìn đến 2030;

Căn cứ Thông tư số 01/2014/TT-BKHĐT ngày 09/01/2014 của Bộ Kế hoạch và Đầu tư hướng dẫn thực hiện Nghị định 38/2013/NĐ-CP ngày 23/4/2013 của Chính phủ về quản lý và sử dụng nguồn hỗ trợ phát triển chính thức (ODA) và nguồn vốn vay ưu đãi của các nhà tài trợ;

Căn cứ Thông tư số 218/2013/TT-BTC ngày 31/12/2013 của Bộ Tài chính quy định về quản lý tài chính đối với các Chương trình, dự án sử dụng nguồn vốn hỗ trợ phát triển chính thức (ODA) và vay ưu đãi nước ngoài của các nhà tài trợ;

Căn cứ Quyết định của Thủ tướng Chính phủ số 48/2008/CP-TTg ngày 03/4/2008 ban hành hướng dẫn chung lập Báo cáo nghiên cứu khả thi dự án sử dụng vốn hỗ trợ phát triển chính thức nhóm 05 Ngân hàng (Ngân hàng Phát triển Châu Á, Cơ quan Phát triển Pháp, Ngân hàng Hợp tác quốc tế Nhật Bản, Ngân hàng tái thiết Đức, Ngân hàng Thế giới);

Căn cứ Công văn số 5350/VPCP-QHQT ngày 10/07/2015 của Văn phòng Chính phủ về Dự án “Phát triển nông thôn tổng hợp nhằm cải thiện khả năng thích ứng với biến đổi khí hậu vùng ĐBSCL”, vay vốn Ngân hàng Thế giới (WB);

Căn cứ Công văn số 1825/TTg-QHQT ngày 14/10/2015 của Thủ tướng Chính phủ về việc lựa chọn nhà thầu tư vấn chuẩn bị Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cửu Long”, vay vốn WB;

Căn cứ Quyết định số 736/QĐ-TTg ngày 29/04/2016 của Thủ tướng Chính phủ về việc phê duyệt danh mục Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cửu Long”, vay vốn WB;

Căn cứ Quyết định số 5719/QĐ-BNN-XD ngày 30/12/2014 của Bộ Nông nghiệp và Phát triển nông thôn phê duyệt Dự án đầu tư xây dựng công trình Dự án thủy lợi Bắc Bến Tre vay vốn Chính phủ Nhật Bản (JICA);

Căn cứ Công văn số 1628/BTNMT-KH ngày 06/05/2016 của Bộ Tài nguyên và Môi trường về việc tổng hợp, phê duyệt Báo cáo nghiên cứu khả thi dự án ICRSL, sử dụng vốn vay WB;

Căn cứ Công văn số 3427/BKHĐT-QLQH ngày 06/05/2016 của Bộ Kế hoạch và Đầu Tư về việc tổng hợp tiểu dự án 6 vào Báo cáo khả thi Dự án ICRSL;

Căn cứ Quyết định số 1234/QĐ-UBND ngày 05/05/2016 của UBND tỉnh An Giang về việc Phê duyệt Báo cáo nghiên cứu khả thi cho Tiểu dự án Tăng cường khả năng thích ứng và quản lý nước cho vùng thượng nguồn sông Cừ Long huyện An Phú tỉnh An Giang;

Căn cứ Quyết định số 1044/QĐ-UBND ngày 06/5/2016 của UBND tỉnh Kiên Giang về việc phê duyệt Báo cáo nghiên cứu khả thi Tiểu dự án số 9: Đầu tư xây dựng cơ sở hạ tầng phòng chống xói lở bờ biển và hỗ trợ nuôi trồng thủy sản ở huyện An Minh, An Biên;

Căn cứ Quyết định số 1039/QĐ-UBND ngày 09/05/2016 của UBND tỉnh Bến Tre về việc phê duyệt Dự án đầu tư xây dựng cơ sở hạ tầng phục vụ phát triển sinh kế bền vững cho người dân vùng ven biển Ba Tri, tỉnh Bến Tre nhằm thích ứng với biến đổi khí hậu.

Xét đề nghị của Trưởng Ban Quản lý trung ương các dự án Thủy lợi tại Tờ trình số 705/CPO-ICRSL ngày 04/05/2016 xin thẩm định Báo cáo nghiên cứu khả thi Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cừ Long”, vay vốn WB;

Xét Báo cáo thẩm định số 378/BC-HTQT-ĐP ngày 05/05/2016 của Vụ Hợp tác quốc tế Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cừ Long”, vay vốn WB;

Theo đề nghị của Vụ trưởng Vụ Hợp tác quốc tế; Vụ trưởng Vụ Kế hoạch; Cục trưởng Cục Quản lý xây dựng công trình; Tổng cục trưởng Tổng cục Thủy lợi.

QUYẾT ĐỊNH

Điều 1. Phê duyệt Báo cáo nghiên cứu khả thi Dự án “Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cừ Long” với các nội dung chính như sau:

1. Tên dự án: Chống chịu khí hậu tổng hợp và sinh kế bền vững đồng bằng sông Cừ Long (ICRSL).

2. Tên nhà tài trợ: Ngân hàng Thế giới (WB).

3. Cơ quan chủ quản dự án: Bộ Nông nghiệp và Phát triển nông thôn.

4. Chủ dự án: Ban Quản lý Trung ương các Dự án Thủy lợi (CPO) thuộc Bộ Nông nghiệp và Phát triển nông thôn.

5. Tổ chức tư vấn lập dự án: Viện Khoa học Thủy lợi Việt Nam.

6. Phạm vi dự án:

6.1. Cấp Trung ương: Bộ Nông nghiệp và Phát triển nông thôn (MARD), Bộ Tài nguyên và Môi trường (MONRE) và Bộ Kế hoạch và Đầu tư (MPI).

6.2. Cấp địa phương: Các tỉnh An Giang, Đồng Tháp, Bến Tre, Trà Vinh, Vĩnh Long, Sóc Trăng, Bạc Liêu, Cà Mau và Kiên Giang.

7. Thời gian thực hiện dự án: 06 năm, kể từ ngày Hiệp định tài trợ có hiệu lực

8. Mục tiêu dự án:

8.1. Mục tiêu tổng quát.

Tăng cường các công cụ lập quy hoạch, kế hoạch thích ứng với biến đổi khí hậu, nâng cao khả năng chống chịu với biến đổi khí hậu cho các hoạt động quản lý tài nguyên đất và nước tại một số tỉnh được lựa chọn khu vực ĐBSCL.

8.2. Mục tiêu cụ thể.

8.2.1 Tăng cường hạ tầng cơ sở dữ liệu và khung thể chế, phục vụ quản lý, điều hành nhằm phát huy lợi thế tổng hợp của ĐBSCL, nâng cao năng lực chống chịu khí hậu, thời tiết bất lợi và giảm thiểu rủi ro, góp phần ổn định sinh kế, cải thiện đời sống cho cộng đồng dân cư, phát triển bền vững cho khu vực dự án trong điều kiện biến đổi khí hậu.

8.2.2 Chủ động điều tiết nguồn nước ngọt, kiểm soát lũ để nâng cao giá trị gia tăng của sản xuất nông nghiệp, nuôi trồng thủy sản nước ngọt ở vùng thượng nguồn ĐBSCL.

8.2.3 Thích ứng hài hòa với sự thay đổi của nguồn nước mặn-lợ-ngọt, hạn chế xói lở bờ biển và ngập úng, đảm bảo nguồn nước ngọt cho vùng và đa dạng hóa các mô hình sản xuất nông nghiệp và nuôi trồng thủy sản để đảm bảo sinh kế, cải thiện đời sống cho cộng đồng ven biển và cửa sông.

8.2.4 Hạn chế tình trạng xói lở bờ biển, nâng cao khả năng thích ứng với xâm nhập mặn, phục hồi các hệ sinh thái bản địa, trồng rừng ngập mặn, đa dạng hóa các mô hình sản xuất nông nghiệp và nuôi trồng thủy sản để đảm bảo sinh kế, cải thiện đời sống cho cộng đồng vùng bán đảo.

9. Nội dung đầu tư chủ yếu.

9.1 Hợp phần 1: Tăng cường công tác giám sát, phân tích và hệ thống cơ sở dữ liệu

Hợp phần này tập trung vào việc khắc phục tình trạng thiếu hụt cơ sở dữ liệu, đồng bộ hóa các tài liệu và sử dụng tối ưu các cơ sở dữ liệu trong việc chỉ đạo điều hành về lập quy hoạch, chính sách, phối hợp, đặc biệt là vận hành hệ thống thủy lợi trong việc phục vụ sản xuất, dân sinh nhằm giảm thiểu tối đa các tác động bất lợi do biến đổi khí hậu gây ra. Hợp phần này bao gồm 06 tiểu dự án, trong đó có 04 tiểu dự án do Bộ Tài nguyên và Môi Trường thực hiện, 01 tiểu dự án do Bộ Nông nghiệp và Phát triển nông thôn thực hiện và 01 tiểu dự án do Bộ Kế hoạch và Đầu tư thực hiện.

9.2 Hợp phần 2: Quản lý lũ vùng thượng nguồn

Mục tiêu chính của Hợp phần này là để bảo vệ và nâng cao các tác dụng tích cực của lũ qua biện pháp kiểm soát lũ (giữ lũ) và tăng thu nhập nông thôn và bảo vệ tài sản có giá trị cao. Có thể sử dụng biện pháp: (i) kiểm soát lũ (giữ nước lũ) có lợi hơn ở các khu vực nông thôn và cung cấp các lựa chọn thay thế trong sản xuất nông nghiệp và thủy sản; ii) cung cấp hỗ trợ sinh kế cho nông dân để họ có vụ sản xuất thay thế vụ lúa trong mùa mưa, bao gồm cả nuôi trồng thủy sản; iii) xây dựng và nâng cấp cơ sở hạ tầng để phục vụ sản xuất; và iv) hỗ trợ sử dụng nước hiệu quả trong nông nghiệp vào mùa khô. Hợp phần này bao gồm 3 Tiểu dự án nằm trên địa bàn các tỉnh An Giang, Đồng Tháp và Kiên Giang.

9.3 Hợp phần 3: Thích ứng với chuyển đổi độ mặn vùng cửa sông ven biển

Hợp phần này nhằm giải quyết các thách thức liên quan đến xâm nhập mặn, xói lở bờ biển, nuôi trồng thủy sản bền vững và cải thiện sinh kế cho các cộng đồng sống tại vùng ven biển. Các hoạt động sẽ bao gồm: i) xây dựng hệ thống phòng hộ ven biển bao gồm các loại kè, đê bao và rừng ngập mặn, ii) nâng cấp cơ sở hạ tầng thủy lợi và nông nghiệp dọc theo vùng ven biển để tăng tính linh hoạt và bền vững cho nuôi trồng thủy sản và thích ứng với thay đổi độ mặn; iii) hỗ trợ cho nông dân để chuyển đổi (nếu cần) sang các hoạt động canh tác nước lợ có tính bền vững hơn như rừng ngập mặn kết hợp nuôi tôm, lúa-tôm, và các hoạt động nuôi trồng thủy sản khác; và iv) hỗ trợ nông nghiệp thông minh thích ứng với khí hậu bằng cách tạo điều kiện sử dụng nước hiệu quả trong mùa khô. Hợp phần này bao gồm 4 Tiểu dự án nằm trên địa bàn các tỉnh Bến Tre, Trà Vinh, Vĩnh Long, Sóc Trăng.

9.4 Hợp phần 4: Bảo vệ khu vực bờ biển vùng bán đảo

Hợp phần này nhằm giải quyết những thách thức liên quan đến xói lở bờ biển, quản lý nước ngầm, cung cấp nước sinh hoạt, nuôi trồng thủy sản bền vững, và cải thiện sinh kế cho các cộng đồng sống ở các khu vực ven biển và cửa sông. Các hoạt động tiềm năng bao gồm: i) xây dựng/cải tạo đai rừng phòng hộ ven biển bao gồm kết hợp các loại kè, đê bao và vành đai rừng ngập mặn; ii) nâng cấp cơ sở hạ tầng kiểm soát nước mặn dọc theo vùng ven biển để giúp cho các hoạt động nuôi trồng thủy sản được linh hoạt và bền vững; iv) kiểm soát lượng nước ngầm sử dụng cho nông nghiệp/ thủy sản và phát triển các nguồn nước ngọt để dùng cho sinh hoạt; v) hỗ trợ cho nông dân để giúp họ thực hiện các hoạt động canh tác nước lợ có tính bền vững hơn như mô hình rừng ngập mặn – tôm và các hoạt động thủy sản khác; và vi) hỗ trợ nông nghiệp thông minh thích hợp với khí hậu để sử dụng nước hiệu quả. Hợp phần này bao gồm 3 Tiểu dự án nằm trên địa bàn các tỉnh Bạc Liêu, Cà Mau và Kiên Giang.

9.5 Hợp phần 5: Hỗ trợ quản lý và thực hiện Dự án

Hợp phần này sẽ được chia thành hỗ trợ quản lý dự án cho các Bộ: Nông nghiệp và Phát triển nông thôn, Tài nguyên và Môi trường, Kế hoạch và Đầu tư và các tỉnh tham gia dự án. Hợp phần này được dự kiến sẽ hỗ trợ các chi phí gia tăng liên quan tới quản lý Dự án và cung cấp các dịch vụ tư vấn để hỗ trợ quản lý dự án tổng thể, quản lý tài chính, đấu thầu, chính sách an toàn và giám sát và đánh giá.

(Chi tiết xem Phụ lục 1 đính kèm)

9.6 Các Tiểu dự án đầu tư xây dựng thực hiện năm đầu thuộc Hợp phần 2,3,4.

Các Tiểu dự án thực hiện năm đầu sau khi Hiệp định có hiệu lực bao gồm: Tiểu dự án 2 thuộc Hợp phần 2; Tiểu dự án số 4,6 thuộc Hợp phần 3; Tiểu dự án số 9 thuộc Hợp phần 4.

(Chi tiết xem Phụ lục 2 đính kèm)

9.7 Một số giải pháp kỹ thuật chủ yếu:

a) Nâng cấp bờ bao: Bờ bao làm bằng đất đắp, gia cố mái, mặt bằng bê tông.

b) Công lấy nước: Xử lý nền bằng cọc bê tông cốt thép hoặc cừ tràm, kết cấu công bằng bê tông cốt thép, cửa công bằng thép, đóng mở cưỡng bức...

c) Công trình tạo bãi trồng rừng ngập mặn bảo vệ đê biển: Kết hợp giải pháp kết cấu cứng (bê tông cốt thép) và mềm (hàng rào bằng cây) để tái tạo bãi bồi.

d) Các thiết bị quan trắc: Tùy theo cấp công trình để lắp đặt loại thiết bị hợp lý, dễ vận hành, bảo trì, bảo dưỡng, điều khiển điện tử và liên kết với hệ thống quản lý.

10. Kết quả chủ yếu:

10.1 Thông qua các hoạt động của Hợp phần 1, Dự án sẽ tác động đến các vấn đề tồn tại hiện nay trong việc quan trắc nước mặt, nước dưới đất, tình trạng cảnh báo, dự báo sạt lở bờ sông và bờ biển. Vận hành kịp thời các hệ thống thủy lợi để phục vụ sản xuất và dân sinh đáp ứng với diễn biến bất thường của biến đổi khí hậu. Kết quả của Dự án sẽ hỗ trợ cho các quá trình lập quy hoạch, kế hoạch ngắn hạn, trung hạn và tầm nhìn dài hạn để thích ứng với biến đổi khí hậu tại đồng bằng sông Cửu Long (ĐBSCL).

10.2 Dự án tác động trực tiếp đến tổng diện tích 1,183 triệu héc ta với tổng dân số khoảng 3,95 triệu người thuộc địa bàn của 26 huyện ở 9 tỉnh thuộc ĐBSCL, tác động gián tiếp lên 4 vùng (ĐTM, TGXL, BĐCM và vùng cửa sông ven biển) với tổng diện tích 1,501 triệu héc ta tương ứng với dân số khoảng 4,97 triệu người;

10.3 Dự án hỗ trợ cả về mặt kỹ thuật, hạ tầng để chuyển đổi sản xuất cho tổng số 47.914 ha, tiến hành hướng dẫn và đào tạo 40.830 người dân có kỹ thuật để chuyển đổi sản xuất theo hướng bền vững, có khả năng thích ứng với biến đổi khí hậu và nước biển dâng trong tương lai;

10.4 Nâng cấp 470km đê, bờ bao và 192 cống các loại, nhằm đảm bảo điều kiện ổn định sản xuất trong điều kiện biến đổi khí hậu, bảo vệ 27 km bờ biển, đồng thời rà soát và nâng cấp đai rừng ngập mặn ven biển với tổng chiều dài 50km, tổng số diện tích trồng rừng bảo vệ bờ biển là 1.000ha và trồng rừng trong vùng sản xuất là 1.200ha.

11. Các hoạt động cụ thể tại từng Bộ:

11.1 Bộ Nông nghiệp và Phát triển nông thôn

Chịu trách nhiệm điều phối chung toàn Dự án, chỉ đạo thực hiện Hợp phần 2,3,4 và trực tiếp quản lý thực hiện Tiểu dự án 5 thuộc Hợp phần 1, Tiểu dự án 2,6 thuộc Hợp phần 2,3.

11.2 Bộ Tài nguyên và Môi trường

Chịu trách nhiệm điều phối Hợp phần 1, trực tiếp quản lý thực hiện các Tiểu dự án từ 1- 4 thuộc Hợp phần 1.

11.3 Bộ Kế hoạch và Đầu tư

Chịu trách nhiệm quản lý thực hiện Tiểu dự án 6 thuộc Hợp phần 1.

(Chi tiết xem Phụ lục 1 đính kèm)

12. Tổng mức đầu tư và nguồn vốn dự án.

Tổng mức đầu tư Dự án dự kiến là 384,979 triệu USD tương đương 8.577,332 tỷ đồng (theo tỷ giá chuyển đổi do Ngân hàng Nhà nước Việt Nam công bố ngày 28/02/2016: 1 USD = 22.280 VND).

Trong đó:

- Vốn vay: 310 triệu USD, tương đương: 6.906,800 tỷ đồng;
- Vốn đối ứng: 72,547 triệu USD, tương đương: 1.616,347 tỷ đồng;
- Vốn tư nhân: 2,432 triệu USD, tương đương: 54,185 tỷ đồng. Đây là nguồn vốn huy động của các cá nhân, doanh nghiệp, khi tham gia cùng dự án để tạo ra các mô hình trình diễn, vừa tạo hiệu quả trong sản xuất, vừa phục vụ cho việc đào tạo, nhân rộng quy mô dự án.

(Chi tiết xem Phụ lục 4 đính kèm)

13. Cơ chế tài chính trong nước đối với dự án

13.1 Đối với vốn vay

- Ngân sách Trung ương sẽ cấp phát 100% cho MARD, MONRE, MPI thực hiện đối với các nội dung thuộc nhiệm vụ chi của Ngân sách Trung ương;
- Đối với các địa phương có các tiểu dự án do tỉnh làm chủ quản đầu tư, được Ngân sách Trung ương hỗ trợ cấp phát từ 80% đến 70%, cho vay lại từ 20% đến 30% vốn vay WB.

13.2 Đối với vốn đối ứng

Các tiểu dự án do MARD, MONRE và MPI làm chủ quản: Ngân sách cấp phát 100% cho các Bộ tham gia dự án đối với các nội dung chi thuộc nhiệm vụ của Ngân sách Trung ương.

- Địa phương tự bố trí ngân sách thực hiện các hoạt động thuộc nhiệm vụ của địa phương. Các nội dung chi bao gồm: quản lý các tiểu dự án, bồi thường hỗ trợ tái định cư và chi phí khác.

(Chi tiết xem Phụ lục 3 đính kèm)

13.3. Tài khoản dự án.

Tài khoản chuyên dùng (tài khoản cấp 1): Được mở tại Ban quản lý Trung ương các dự án Thủy lợi, các Ban quản lý dự án của MONRE, MPI, Ban quản lý đầu tư và xây dựng thủy lợi 10 (ICMB10) và 8 tỉnh vùng dự án bao gồm An Giang, Đồng Tháp, Kiên Giang, Bến Tre, Trà Vinh, Sóc Trăng, Bạc Liêu và Cà Mau.

14. Tổ chức quản lý, thực hiện dự án.

Dự án thực hiện theo mô hình dự án "ô" trong đó có cơ quan chủ quản điều phối chung toàn dự án và các cơ quan chủ quản của dự án thành phần.

14.1. Cấp Trung ương.

a) Bộ Nông nghiệp và Phát triển nông thôn là Cơ quan chủ quản Dự án, chịu trách nhiệm trước Chính phủ về việc tổ chức điều phối thực hiện Dự án, thực hiện những cam kết với nhà tài trợ và các quy định về quản lý vốn ODA của Chính phủ. Đồng thời, Bộ Nông nghiệp và Phát triển nông thôn trực tiếp là cơ quan chủ quản Tiểu dự án số 5 thuộc Hợp phần 1, các Tiểu dự án số 2 và 6 của Hợp phần 2 và 3.

b) Bộ Nông nghiệp và Phát triển nông thôn thành lập Ban Chỉ đạo dự án để chỉ đạo chung việc thực hiện dự án. Trưởng ban chỉ đạo do một lãnh đạo Bộ Nông nghiệp và Phát triển nông thôn đảm nhiệm; thành viên Ban Chỉ đạo gồm: Đại diện lãnh đạo của Bộ Tài nguyên và Môi trường, Bộ Kế hoạch và Đầu tư, lãnh đạo các tỉnh trong vùng dự án, lãnh đạo các cơ quan liên quan của Bộ Nông nghiệp và Phát triển nông thôn và Ban Quản lý Trung ương các dự án Thủy lợi.

c) Cục Quản lý xây dựng công trình là cơ quan chuyên môn chủ trì, phối hợp với các cơ quan liên quan tham mưu giúp Bộ Nông nghiệp và Phát triển nông thôn trong quản lý, thực hiện chức năng quản lý nhà nước, chịu trách nhiệm hướng dẫn, giám sát và kiểm tra công tác quản lý đầu tư xây dựng các Tiểu dự án, thẩm định các nội dung liên quan trong quá trình quản lý đầu tư xây dựng đối với các Tiểu dự án 2 và 6 thuộc hợp phần 2 và 3.

d) Vụ Hợp tác quốc tế là đầu mối làm việc với nhà tài trợ, chịu trách nhiệm chung về quản lý, giám sát thực hiện dự án tuân thủ Hiệp định vay, hướng dẫn, theo dõi, đánh giá, tổng hợp và định kỳ báo cáo Bộ Nông nghiệp và Phát triển nông thôn việc quản lý, thực hiện nguồn vốn tài trợ theo quy định.

đ) Vụ Kế hoạch giúp Cơ quan chủ quản về công tác kế hoạch tổng thể và kế hoạch vốn hàng năm, công tác báo cáo, theo dõi, giám sát, đánh giá dự án theo đúng tiến độ, chất lượng và đạt mục tiêu đề ra.

e) Vụ Tài chính, Vụ Tổ chức cán bộ, các Tổng cục: Thủy lợi, Thủy sản, lâm nghiệp, Cục Trồng trọt và các đơn vị liên quan thực hiện chức năng quản lý nhà nước, tham mưu cho Bộ Nông nghiệp và Phát triển nông thôn trong việc hướng dẫn, kiểm tra, giám sát, các hoạt động của dự án theo chức năng, nhiệm vụ được phân công.

g) Ban Quản lý Trung ương các dự án Thủy lợi thuộc Bộ Nông nghiệp và Phát triển nông thôn là Chủ dự án, chịu trách nhiệm tổ chức điều phối và quản

lý chung hoạt động của toàn dự án, hướng dẫn, kiểm tra, giám sát các đơn vị thực hiện dự án; là chủ đầu tư Tiểu dự án số 5 thuộc Hợp phần 1.

h) Ban Quản lý Trung ương các dự án thủy lợi và các Sở Nông nghiệp và Phát triển nông thôn trong vùng dự án khi triển khai thực hiện các vấn đề kỹ thuật liên quan đến chuyển đổi cây trồng tiết kiệm nước, các mô hình nuôi trồng thủy sản, trồng rừng và tái tạo rừng ngập mặn kết hợp nuôi trồng thủy sản v.v... nhằm nâng cao chuỗi giá giá trị sản phẩm, phát triển bền vững, thích ứng với biến đổi khí hậu, cần có ý kiến của các đơn vị: Cục trồng trọt, Cục bảo vệ thực vật, các Tổng Cục: Thủy sản, Lâm nghiệp, Viện Chính sách và Chiến lược Phát triển Nông nghiệp và Nông thôn và Trung tâm Khuyến nông Quốc gia.v.v... trước khi triển khai thực hiện các mô hình thí điểm liên quan đến chuyên ngành.

i) Ban Quản lý đầu tư và Xây dựng thủy lợi 10 là Chủ đầu tư các Tiểu dự án số 1, Hợp phần 2; số 6, Hợp phần 3.

k) Bộ Tài nguyên và Môi trường là cơ quan điều phối Hợp phần 1; đồng thời là cơ quan chủ quản các Tiểu dự án từ 1-4 thuộc Hợp phần 1

l) Bộ Kế hoạch và Đầu tư là cơ quan chủ quản Tiểu dự án số 6 thuộc Hợp phần 1

m) Các Bộ Tài nguyên và Môi trường, Kế hoạch và Đầu tư chịu trách nhiệm tổ chức lập, thẩm định, phê duyệt, thực hiện và quyết toán các tiểu dự án được phân giao tại Khoản k, 1 Điều này, đảm bảo hiệu quả đầu tư, đúng qui định, đồng thời phối hợp chặt chẽ với Bộ Nông nghiệp và Phát triển nông thôn trong công tác tổ chức thực hiện Dự án.

14.2. Cấp địa phương.

a) Ủy ban nhân dân các tỉnh tham gia dự án là cơ quan chủ quản (cấp quyết định đầu tư) các Tiểu dự án trong phạm vi của tỉnh quản lý, chỉ đạo lập dự án đầu tư, lấy ý kiến của Bộ Nông nghiệp và Phát triển nông thôn trước khi phê duyệt các Tiểu dự án, trường hợp cần điều chỉnh dự án đầu tư phải lấy ý kiến của Bộ Nông nghiệp và Phát triển nông thôn; bố trí đủ, kịp thời vốn đối ứng để thực hiện theo nhiệm vụ được giao trong tổng mức đầu tư của Dự án; phê duyệt Báo cáo đánh giá tác động môi trường trước khi phê duyệt dự án đầu tư Tiểu dự án, phê duyệt Báo cáo đánh giá môi trường xã hội/Kế hoạch quản lý môi trường xã hội, Kế hoạch hành động tái định cư, Kế hoạch phát triển dân tộc thiểu số (nếu có). Quyết toán tiểu dự án sau khi hoàn thành. Quyết định đầu tư, bố trí kinh phí, tổ chức thực hiện và quyết toán toàn bộ hợp phần đền bù, GPMB, tái định cư trong phạm vi địa phương.

b) Ủy ban nhân dân tỉnh quyết định giao Sở Nông nghiệp và Phát triển nông thôn là Chủ đầu tư quản lý thực hiện các Tiểu dự án trên địa bàn tỉnh.

c) Các đơn vị liên quan tham gia trong quá trình triển khai dự án tuân theo “Sổ tay hướng dẫn thực hiện dự án” (POM) được WB thông qua và Bộ Nông nghiệp và Phát triển nông thôn, Bộ Tài nguyên và Môi trường phê duyệt.

15. Các hoạt động thực hiện trước

15.1 Sau khi Đề cương chi tiết dự án được phê duyệt

- Trình cấp có thẩm quyền phê duyệt các Khung chính sách (Khung chính sách tái định cư, Khung quản lý môi trường và xã hội; Khung phát triển dân tộc thiểu số);

- Thành lập các Ban quản lý dự án và tiểu dự án;

- Tổ chức lập, thẩm định và phê duyệt Báo cáo nghiên cứu khả thi (FS) Dự án và các Tiểu dự án năm đầu;

- Chuẩn bị Sổ tay vận hành Dự án;

- Chuẩn bị Kế hoạch lựa chọn nhà thầu 18 tháng; chuẩn bị các hồ sơ mời thầu để huy động tư vấn hỗ trợ kỹ thuật, giám sát độc lập, giám sát và đánh giá, khảo sát, thiết kế các Tiểu dự án thực hiện năm đầu.

15.2 Sau khi Báo cáo nghiên cứu khả thi được phê duyệt đến khi Hiệp định có hiệu lực

- Đấu thầu các gói Tư vấn hỗ trợ kỹ thuật bao gồm Tư vấn hỗ trợ quản lý dự án, Tư vấn giám sát & đánh giá các Tư vấn giám sát chính sách an toàn theo quy định của Nhà tài trợ, huy động Tư vấn khảo sát, lập thiết kế. Đối với các Tư vấn lập Thiết kế dùng nguồn vốn trong nước có thể ký hợp đồng và huy động ngay sau khi FS được phê duyệt. Đối với các Tư vấn hỗ trợ kỹ thuật dùng vốn vay sẽ huy động sau khi Hiệp định có hiệu lực;

- Lập Thiết kế chi tiết và Hồ sơ mời thầu các gói thầu cho các Tiểu dự án thực hiện năm đầu;

- Phê duyệt Kế hoạch lựa chọn nhà thầu 18 tháng đầu, triển khai đấu thầu ngay sau khi thiết kế chi tiết được phê duyệt. Ký hợp đồng sau khi Hiệp định có hiệu lực.

Điều 2. Các lưu ý trong quá trình thực hiện giai đoạn sau:

- Thí nghiệm mô hình thủy lực cho 3 cống Vũng Liêm, Bông Bót, Tân Dinh để kiểm tra sự phù hợp của khẩu diện cống, kết cấu tiêu năng, phòng xói lở;

- Thực hiện đúng các công tác khảo sát, thiết kế của giai đoạn tiếp theo;

- Cần có giải pháp tiên bộ khoa học trong việc thiết kế các cống lắp ghép, tiêu chuẩn hóa nhằm nâng cao chất lượng, giảm giá thành;

- Nghiên cứu giải pháp đề vận chuyển thuyền của người dân trong thời gian đóng cống;

- Đối với các công trình hạ tầng ven biển cần xem xét kỹ các giải pháp công trình như giải pháp cứng, mềm, dòng chảy thủy văn, bồi lắng, xói lở;

- Nghiên cứu bổ sung chất lượng nước, độ mặn từ đó đề xuất các mô hình sản xuất thủy sản, công trình cho phù hợp;

- Đánh giá tác động lũ xuyên biên giới trên dòng sông chính và xây dựng các về công trình, nuôi trồng thủy sản, cây trồng tiết kiệm nước để chủ động nguồn nước không phụ thuộc vào việc xả nước ở thượng lưu;

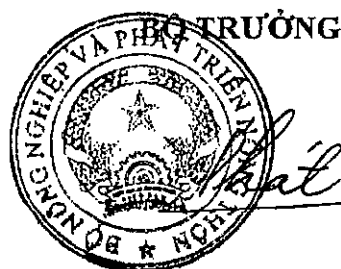
- Nghiên cứu tính toán hiện tượng lún đất khi tác động của biến đổi khí hậu, đảm bảo sau khi xây dựng công trình sẽ phát huy hiệu quả lâu dài, bền vững;

- Quy trình quản lý nguồn nước trong vùng, qui trình vận hành của các công trình mang tính liên vùng, đảm bảo các tỉnh đều có lợi ích, giảm bớt tối đa việc tranh chấp nguồn nước giữa các tỉnh. Giải pháp trữ nước vào mùa lũ, dùng cho mùa khô và không phụ thuộc vào xả nước ở thượng nguồn.

Điều 3. Chánh Văn phòng Bộ, Vụ trưởng các Vụ: Hợp tác quốc tế, Kế hoạch, Tài chính, Tổ chức cán bộ; Cục trưởng Cục Quản lý xây dựng công trình; Tổng cục trưởng các Tổng cục: Thủy lợi, Thủy sản, Lâm nghiệp; Cục trưởng cục trồng trọt; Trưởng Ban Quản lý trung ương các dự án Thủy lợi, Giám đốc Ban Quản lý đầu tư và xây dựng thủy lợi 10; Bộ trưởng các Bộ: Tài nguyên và Môi trường, Kế hoạch và Đầu Tư; Chủ tịch Ủy ban nhân dân tỉnh, Giám đốc Sở Nông nghiệp và Phát triển nông thôn các tỉnh tham gia dự án và Thủ trưởng các đơn vị có liên quan chịu trách nhiệm thi hành Quyết định này./.

Nơi nhận:

- Như Điều 3;
- Thủ tướng Chính phủ (để b/c);
- Các Bộ: NG, TP;
- Ngân hàng Nhà nước Việt Nam;
- Lưu: VT, HTQT (NHL-75).



Cao Đức Phát

PHỤ LỤC 1

Danh mục các Tiểu dự án dự kiến thực hiện

(Kèm theo Quyết định số **1693** /BN-NTQT ngày **09** /05/2016 của Bộ trưởng Bộ Nông nghiệp và Phát triển nông thôn)

Ký hiệu	Tên các tiểu dự án	Địa điểm/Cơ quan chủ quản
I	Hợp phần 1 : Tăng cường công tác giám sát, phân tích và hệ thống cơ sở dữ liệu	
HP1-1	Đầu tư nâng cấp và hoàn thiện hệ thống quan trắc, giám sát tài nguyên nước mặt tại Đồng bằng sông Cửu Long	13 tỉnh ĐBSCL/Bộ TN&MT
HP1-2	Nâng cấp, xây dựng mạng quan trắc nước dưới đất Đồng bằng sông Cửu Long trong điều kiện biến đổi khí hậu	13 tỉnh ĐBSCL/Bộ TN&MT
HP1-3	Xây dựng Hệ thống giám sát biến động bờ sông, bờ biển khu vực đồng bằng Sông Cửu Long bằng công nghệ viễn thám	13 tỉnh ĐBSCL/Bộ TN&MT
HP1-4	Đầu tư xây dựng Trung tâm dữ liệu vùng đồng bằng sông Cửu Long tích hợp dữ liệu tài nguyên và môi trường của khu vực phục vụ phân tích, đánh giá và hỗ trợ ra quyết định về phát triển bền vững trong điều kiện biến đổi khí hậu	TP. Cần Thơ/Bộ TN&MT
HP1-5	Tăng cường năng lực dự báo chuyên ngành phục vụ quản lý vận hành các công trình thủy lợi ở ĐBSCL	13 tỉnh ĐBSCL/Bộ NN&PTNT
HP1-6	Đề án phát triển tổng thể kết cấu hạ tầng thích ứng với biến đổi khí hậu phục vụ cho phát triển kinh tế-xã hội vùng ĐBSCL	13 tỉnh ĐBSCL/Bộ KH&ĐT
II	Hợp phần 2 – quản lý lũ vùng thượng nguồn	
TDA1	Nâng cao khả năng thoát lũ và thích ứng biến đổi khí hậu cho vùng Tứ giác Long Xuyên	An Giang, Kiên Giang / Bộ NN&PTNT
TDA2	Tăng cường khả năng thích ứng và quản lý nước cho vùng thượng nguồn sông Cửu Long huyện An Phú tỉnh An Giang	An Giang
TDA3	Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện phía Bắc tỉnh Đồng Tháp)	Đồng Tháp
III	Hợp phần 3 – Thích ứng với chuyển đổi độ mặn vùng Cửa sông	
TDA4	Đầu tư xây dựng cơ sở hạ tầng phục vụ phát triển sinh kế bền vững cho người dân vùng ven biển Ba Tri, tỉnh Bến Tre	Bến Tre
TDA5	Đầu tư xây dựng cơ sở hạ tầng cải thiện sinh kế cho người dân huyện Bắc Thạnh Phú, tỉnh Bến Tre	Bến Tre
TDA6	Kiểm soát nguồn nước, thích ứng với biến đổi khí hậu vùng Nam Măng Thít, tỉnh Trà Vinh và Vĩnh Long	Trà Vinh, Vĩnh Long / Bộ NN&PTNT

Stial

Ký hiệu	Tên các tiểu dự án	Địa điểm/Cơ quan chủ quản
TDA7	Đầu tư xây dựng cơ sở hạ tầng phục vụ chuyển đổi sản xuất phù hợp với điều kiện sinh thái, nâng cao sinh kế, thích ứng biến đổi khí hậu vùng Cù Lao Dung	Sóc Trăng
IV	Hợp phần 4 – Bảo vệ khu vực bờ biển vùng Bán đảo	
TDA8	Đầu tư xây dựng cơ sở hạ tầng để phòng, chống xói lở bờ biển, cung cấp nước ngọt và phục vụ nuôi tôm – rừng vùng ven biển tỉnh Cà Mau	Cà Mau
TDA9	Đầu tư xây dựng cơ sở hạ tầng phòng chống xói lở bờ biển và hỗ trợ nuôi trồng thủy sản ở huyện An Minh, An Biên	Kiên Giang
TDA 10	Đầu tư xây dựng cơ sở hạ tầng phục vụ bảo vệ rừng và phát triển nuôi trồng thủy sản bền vững, huyện Hòa Bình, Đông Hải và TP. Bạc Liêu	Bạc Liêu



PHỤ LỤC 2

Nội dung chính các tiêu dự án thực hiện năm đầu hợp phần 2, 3, 4
(Kèm theo Quyết định số 1693/QĐ-BNN-HTQT ngày 09/05/2016 của Bộ trưởng Bộ Nông nghiệp và Phát triển nông thôn)

1. Tiêu dự án số 2

Tên tiêu dự án: Tăng cường khả năng thích ứng và quản lý nước cho vùng thượng nguồn sông Cửu Long, huyện An Phú, tỉnh An Giang.

Mục tiêu: Nâng cao khả năng thích ứng và quản lý lũ vùng thượng nguồn sông Cửu Long góp phần ổn định sản xuất, nâng cao thu nhập của người dân vùng lũ và phù hợp với yêu cầu thoát lũ, trữ lũ của vùng đầu nguồn.

Đầu tư hạ tầng: (i) nâng cấp hệ thống đê bao hiện hiện trạng (kiểm soát lũ tháng VIII) với tổng chiều dài $L = 60.953\text{m}$; (ii) xây dựng 15 công điều tiết nước phục vụ sản xuất; (iii) xây dựng hạ tầng thủy lợi nội đồng cho các khu vực thực hiện mô hình sản xuất.

Mô hình chuyển đổi sinh kế và các hoạt động phi công trình: Hỗ trợ xây dựng mô hình sản xuất tại vùng sản xuất 2 vụ (đê bao kiểm soát lũ tháng VIII), vùng sản xuất 3 vụ (đê bao kiểm soát lũ chính vụ) và một số hoạt động phi công trình khác.

2. Tiêu dự án số 4

Tên tiêu dự án: Đầu tư xây dựng cơ sở hạ tầng phục vụ phát triển sinh kế bền vững cho người dân vùng ven biển huyện Ba Tri, tỉnh Bến Tre.

Mục tiêu: Nâng cao khả năng thích ứng với BĐKH vùng ven biển huyện Ba Tri.

Đầu tư hạ tầng: (i) xây dựng 05 công: Đường Khai, Trảng Nước, Đường Tắc, Cây Keo và An Thạnh; (ii) nạo vét 28,7 km kênh; (iii) xây dựng hệ thống thủy lợi nội đồng để phục vụ nuôi tôm an toàn sinh học tại các mô hình sản xuất.

Mô hình chuyển đổi sinh kế và các hoạt động phi công trình: Trồng bổ sung 250ha rừng ngập mặn trong ao tôm hỗ trợ mô hình nuôi tôm sinh thái và mô hình nuôi tôm thẻ chân trắng tại xã Bảo Thạnh, Bảo Thuận, An Thù.

3. Tiêu dự án số 6

Tên tiêu dự án: Kiểm soát nguồn nước, thích ứng với biến đổi khí hậu vùng Nam Măng Thít, tỉnh Trà Vinh và Vĩnh Long.

Mục tiêu: Kiểm soát mặn và triều cường vùng Nam Măng Thít.

Đầu tư hạ tầng: Xây dựng 03 công Vũng Liêm, Bông Bót, Tân Dinh

(Nội dung chi tiết xem Quyết định số 5719/QĐ-BNN-XD ngày 30/12/2014)

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Mô hình chuyển đổi sinh kế và các hoạt động phi công trình: Trồng bổ sung rừng ngập mặn trong ao nuôi tôm và chứng nhận nuôi tôm sinh thái rừng ngập mặn và xây dựng các mô hình nuôi trồng thủy sản an toàn sinh học.

4. Tiểu dự án số 9

Tên tiểu dự án: Đầu tư xây dựng cơ sở hạ tầng phòng chống xói lở bờ biển và hỗ trợ nuôi trồng thủy sản ở huyện An Minh, An Biên.

Mục tiêu: Kiểm soát triều cường, điều tiết nguồn nước mặn và ngọt, phòng chống xói lở bờ biển để ổn định sản xuất và sinh kế cho người dân.


Đầu tư hạ tầng: i) Xây dựng 9 cống trên tuyến đê ven biển; ii) xây dựng kè tạo bãi khôi phục rừng ngập mặn; iii) xây dựng hệ thống thủy lợi nội đồng tại các mô hình sản xuất để hỗ trợ nuôi tôm an toàn sinh học.

Mô hình chuyển đổi sinh kế và các hoạt động phi công trình: Hỗ trợ xây dựng các mô hình sản xuất vùng ven biển và vùng trong đê biển.

PHỤ LỤC 3

ay lại vốn WB

(Kèm theo Quyết định số 1693/QĐ-BNN/HTQT ngày 09/05/2016 của Bộ trưởng Bộ
Nông nghiệp và Phát triển nông thôn)



STT	Tỉnh	Tỷ lệ (%)
1	Cà Mau	30
2	Kiên Giang	30
3	Đồng Tháp	30
4	An Giang	30
5	Bạc Liêu	20
6	Sóc Trăng	20
7	Bến Tre	20

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PHỤ LỤC 4

Tổng mức đầu tư

(Kèm theo Quyết định số 1693/QĐ-BNN-HQT ngày 09/05/2016 của Bộ trưởng Bộ Nông nghiệp và Phát triển nông thôn)

Bảng 1: Tổng mức đầu tư của Dự án

Đơn vị: triệu đồng

Ký hiệu	Tên các tiểu dự án	Địa điểm/Bộ chủ quản	Vốn vay ODA	Vốn đối ứng					Vốn tư nhân	Tổng mức ĐT
				Tổng	Bộ NN&PT NT	Bộ TN&MT	Bộ KH&ĐT	Địa phương		
I	Hợp phần 1 : Đầu tư để tăng cường công tác giám sát, phân tích và hệ thống cơ sở dữ liệu		1,251.624	104.894	223	103.669	1.003	0.000	0.000	1,356.518
HP1-1	Đầu tư nâng cấp và hoàn thiện hệ thống quan trắc, giám sát tài nguyên nước mặt tại Đồng bằng sông Cửu Long	13 tỉnh ĐBSCL/Bộ TNMT	211.660	22.280		22.280				233.940
HP1-2	Nâng cấp, xây dựng mạng quan trắc nước dưới đất Đồng bằng sông Cửu Long trong điều kiện biến đổi khí hậu	13 tỉnh ĐBSCL/Bộ TNMT	222.800	44.560		44.560				267.360
HP1-3	Xây dựng Hệ thống giám sát biến động bờ sông, bờ biển khu vực đồng bằng Sông Cửu Long bằng công nghệ viễn thám	13 tỉnh ĐBSCL/Bộ TNMT	245.080	22.280		22.280				267.360

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HP1-4	Đầu tư xây dựng Trung tâm dữ liệu vùng đồng bằng sông Cửu Long tích hợp dữ liệu tài nguyên và môi trường của khu vực phục vụ phân tích, đánh giá và hỗ trợ ra quyết định về phát triển bền vững trong điều kiện biến đổi khí hậu	13 tỉnh ĐBSCL/Bộ TNMT	307.464	14.549		14.549				322.013
HP1-5	Tăng cường năng lực dự báo chuyên ngành phục vụ quản lý vận hành các công trình thủy lợi ở ĐBSCL	13 tỉnh ĐBSCL/Bộ NN&PTMT	56.302	223	223					56.524
HP1-6	Đề án phát triển tổng thể kết cấu hạ tầng thích ứng với biến đổi khí hậu phục vụ cho phát triển kinh tế-xã hội vùng ĐBSCL	13 tỉnh ĐBSCL/Bộ KH&ĐT	208.318	1.003			1.003			209.321
II	Hợp phần 2 – quản lý lũ vùng thượng nguồn		1.771.817	472.403	117.015	0.000	0.000	355.388	13.724	2.257.944
TPA 1	Nâng cao khả năng thoát lũ và thích ứng biến đổi khí hậu cho vùng Tứ giác Long Xuyên	An Giang, Kiên Giang/ Bộ NN&PTNT	688.474	250.695	117.015			133.680	4.100	943.268
TPA 2	Tăng cường khả năng thích ứng và quản lý nước cho vùng thượng nguồn sông Cửu Long huyện An Phú tỉnh An Giang	An Giang	513.042	134.126				134.126	3.208	650.375

TDA 3	Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện phía Bắc tỉnh Đồng Tháp)	Đồng Tháp	570.301	87.583				87.583	6.417	664.300
III	Hợp phần 3 – Thích ứng với chuyển đổi độ mặn vùng Cửa sông		1.817.870	549.403	125.370	0.000	0.000	424.033	18.359	2.385.631
TDA 4	Đầu tư xây dựng cơ sở hạ tầng phục vụ phát triển sinh kế bền vững cho người dân vùng ven biển Ba Tri, tỉnh Bến Tre nhằm thích ứng với biến đổi khí hậu	Bến Tre	268.585	38.834				38.834	3.030	310.450
TDA 5	Đầu tư xây dựng cơ sở hạ tầng cải thiện sinh kế cho người dân huyện Bắc Thạnh Phú, tỉnh Bến Tre nhằm thích ứng với biến đổi khí hậu	Bến Tre	287.122	239.176				239.176	3.208	529.506
TDA 6	Kiểm soát nguồn nước, thích ứng với biến đổi khí hậu vùng Nam Măng Thít, tỉnh Trà Vinh và Vĩnh Long	Trà Vinh. Vĩnh Long/Bộ NN&PTNT	615.329	125.370	125.370			0.000	5.347	746.046
TDA 7	Đầu tư xây dựng cơ sở hạ tầng phục vụ chuyển đổi sản xuất phù hợp với điều kiện sinh thái, nâng cao sinh kế, thích ứng biến đổi khí hậu vùng Cù Lao Dung	Sóc Trăng	646.833	146.023				146.023	6.773	799.629



IV	Hợp phần 4 – Bảo vệ khu vực bờ biển vùng Bán đảo		1.815.954	405.830	0.000	0.000	0.000	405.830	22.102	2.243.886
TPA 8	Đầu tư xây dựng cơ sở hạ tầng để phòng, chống xói lở bờ biển, cung cấp nước ngọt và phục vụ nuôi tôm – rừng nhằm cải thiện sinh kế, thích ứng biến đổi khí hậu ở vùng ven biển tỉnh Cà Mau	Cà Mau	657.059	112.625				112.625	10.694	780.379
TPA 9	Đầu tư xây dựng cơ sở hạ tầng phòng chống xói lở bờ biển và hỗ trợ nuôi trồng thủy sản ở huyện An Minh, An Biên	Kiên Giang	609.870	109.395				109.395	7.843	727.108
TPA 10	Đầu tư xây dựng cơ sở hạ tầng phục vụ bảo vệ và phát triển rừng sinh thái, nâng cao sinh kế, thích ứng biến đổi khí hậu ở huyện Hòa Bình, Đông Hải và TP. Bạc Liêu	Bạc Liêu	549.024	183.810				183.810	3.565	736.399
IV	Hợp phần 5 – Hỗ trợ Quản lý và Thực hiện Dự án (Chi tiết tại bảng 2)		249.536	83.817	64.545	9.135	10.137	0.000	0.000	333.353
	Bộ Tài nguyên và môi trường		36.406	9.135		9.135				45.540
	Bộ Nông nghiệp và Phát triển nông thôn		178.998	64.545	64.545					243.543
	Bộ Kế hoạch và Đầu tư		14.482	10.137			10.137			24.619
	Chi phí hỗ trợ vận hành gia tăng Chủ đầu tư các TDA thuộc hợp phần 2.3.4		19.651							19.651
TỔNG			6.906.800	1.616.347	307.152	112.804	11.140	1.185.251	54.185	8.577.332

Bảng 2: Chi phí chi tiết cho hợp phần 5

Đơn vị: triệu đồng

No	Hạng mục chi phí	Tổng	Vốn đối ứng	Vốn vay ODA
I	Phần của Bộ NN&PTNT	243.543	64.545	178.998
1	Nâng cấp văn phòng	1.782	0	1.782
	Nâng cấp văn phòng cho CPMU/MARD	668	0	668
	Trang thiết bị đồ đạc văn phòng CPMU/MARD	1.114	0	1.114
2	Đào tạo, hội thảo	6.907	0	6.907
	Hội thảo	2.005	0	2.005
	Đào tạo đầu thầu, quản lý tài chính	1.337	0	1.337
	Đào tạo nước ngoài	3.565	0	3.565
3	Hoạt động M&E	16.264	0	16.264
	Tư vấn M&E	15.596	0	15.596
	Đào tạo M&E	668	0	668
4	Tư vấn quốc tế CSAT	3.119	0	3.119
5	Kế hoạch quản lý môi trường và xã hội	18.715	0	18.715
	Tư vấn giám sát ESMF	17.824	0	17.824
	Đào tạo, tập huấn CSAT	891	0	891
6	Kiểm toán nội bộ(FM)	5.347	0	5.347
7	Hỗ trợ quản lý dự án	118.307	32.752	85.555
	Tư vấn hỗ trợ thực hiện dự án	77.534	0	77.534
	Tư vấn cá nhân(nông nghiệp, thủy sản, rừng...)	5.347	0	5.347
	Phiên dịch, biên dịch	2.674	0	2.674
	Chuẩn bị FS và tài liệu CSAT	29.410	29.410	0
	Khảo sát, lập phương án rà phá bom mìn cho các TDA thuộc hợp phần 2,3,4	3.342	3.342	0
8	Kiểm toán độc lập	7.798	0	7.798
9	Phần mềm kế toán	980	0	980
10	Nghiên cứu giải pháp phá sóng tạo bãi bồi	17.824	0	17.824
11	Chi phí khác	1.716	1.716	0
	Phí chuyển đổi ngoại tệ	267	267	0
	Kiểm toán quyết toán hoàn thành	1.448	1.448	0
12	Chi phí dự phòng	8.021	0	8.021
12	Chi phí quản lý dự án cho CPMU	30.078	30.078	0
14	Chi phí vận hành	6.684	0	6.684
	Chi phí hỗ trợ vận hành	4.010	0	4.010
	Thuê văn phòng	2.674	0	2.674
II	Phần của Bộ TN&MT	45.540	9.135	36.406

No	Hạng mục chi phí	Tổng	Vốn đối ứng	Vốn vay ODA
III	Phần của Bộ KH&ĐT	24.619	10.137	14.482
IV	Chi phí hỗ trợ vận hành gia tăng Chủ đầu tư các TDA thuộc hợp phần 2,3,4	19.651	0	19.651
	Hợp phần xây lắp cho Tiểu dự án số 1, số 6	668	0	668
	Tiểu dự án số 4, số 5	4.010	0	4.010
	Tiểu dự án số 8	2.139	0	2.139
	Tiểu dự án số 10	2.139	0	2.139
	Hợp phần sinh kế cho Tiểu dự án số 6	2.139	0	2.139
	Tiểu dự án số 3	2.139	0	2.139
	Tiểu dự án số 9 và hợp phần sinh kế tiểu dự án số 1	2.139	0	2.139
	Tiểu dự án số 2 và hợp phần sinh kế tiểu dự án số 1	2.139	0	2.139
	Tiểu dự án số 7	2.139	0	2.139
TỔNG HỢP PHẦN		333.353	83.817	249.536

APPENDIX 2: QUESTIONNAIRE FOR HOUSEHOLD SURVEY

PEOPLE'S COMMITTEE OF DONG THAP PROVINCE DONG THAP PROVINCE DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT

Date of survey: ____ / ____ / 2018

I. SOCIO-ECONOMIC SURVEY

1. Name of household head:

2. Address:

Village:

.....Commune:.....District.....Province.....

Venerable group: []

(Female-headed HH=1; Ethnic minority =2; Disable =3; Poor HH=4; Social-aid household =5; single elderly HH=6)

A. General household information

A1. Household Composition (living together OR contribution/ participating in the primary income/expenses of household)

(circling the order of member)

[illegible]

2											
3											
4											
5											
6											
7											
8											
9											

Investigator: 1a. The number of generation: 1b. The number of members:

Code for column 1.9: 1= economical difficult, 2=Leaving school to working, 3= Far from house to school/difficult traveling, 4 = unwanted studying, 5= academic failure, 6 = Do not study in high level for male, 7= Do not study in high level for female, 8= Others (detail).....

B. Assets

1. House type classification

1. Permanent housing (more than 1 floor/ brick wall, reinforced concrete roof)
2. Semi-permanent (Brick wall, brick/ metal roof ...)
3. Wood housing, leaf roof (Pole, wood/leaf roof ...)
4. Temporary housing (Bamboo houses, cottages, temporary wooden shield ...)
5. No house
6. Others (apartment buildings):.....

2. Does household have residential land use right certificate?

1. Yes
2. No

3. Water use: Which source of water for daily use household use? (choose one option)

	Water for drinking	Water for washing
– Safe water with water meter connected	<input type="checkbox"/>	<input type="checkbox"/>
– Public water tank	<input type="checkbox"/>	<input type="checkbox"/>
– Dug well	<input type="checkbox"/>	<input type="checkbox"/>
– River, spring, pond water	<input type="checkbox"/>	<input type="checkbox"/>
– Rain water	<input type="checkbox"/>	<input type="checkbox"/>
– Buying from other	<input type="checkbox"/>	<input type="checkbox"/>
– Other	<input type="checkbox"/>	<input type="checkbox"/>

4. Sanitation condition? (choose one option)

- | | |
|--------------------------------------|----------------------------------|
| 1. No WC | 4. Hole |
| 2. Septic toilet/ Semi-septic toilet | 5. WC in the pond, river, spring |
| 3. WC with disintegrative basin | 6. Other:..... |

5. Main sources for lighting? (Choose one option)

	For living	For production
– Oil lamp	<input type="checkbox"/>	<input type="checkbox"/>

- Gas, oil ☐
- Electricity ☐
- Generator/hydroelectricity ☐
- Other..... ☐

6. Household amenities and consume

Name	Yes	No	Name	Yes	No
1. Television			8. Car (except farm vehicles)		
2. Internet			9. Refrigerator		
3. Boat			10. Air condition		
4. Motorbike/ electric bicycle			11. Computer, laptop		
5. Phone			12. Washing machine		
6. Mobile phone			13. Water heater		
7. Gas stove			14. Other,..		

C- INCOME AND EXPENSES

1. Main income source last 12months

No.	Income source	Total income (VND)
1	From agricultural activity (farm, raising livestock, aquaculture, reforestation)	
2	From business running	
3	Handicraft	
4	Salary	
5	Money saving	
6	Money supporting for social policy household	
	Total	

2. Household expenditure in last year

No.	Categories	Expenses (VND)
1	Daily activities (meal, drinking, electricity, water)	
2	Built, renovate house	
3	Education	
4	Health care	
5	Money for wedding, funeral	
6	Cost for production activities	
7	Other: _____	
	Total (VND)	

3. Generally, evaluation of the standard of living of HH compare with the others:

1. Good
2. Medium
3. Straitedned
4. Poor
5. No identity

4. Have living conditions of HH been changed in the last 3 years?

1. Unchanged
2. Better
3. Worse

D-ACCESS TO SOCIAL SERVICES

5. Do evaluation social services compare within the last 3 years?

No.	Problems	Better	Unchanged	Worse
1	Health care services			
2	Education			
3	Water supply			
4	Irrigation			
5	Infrastructure (bridge, drainage, road)			
6	Disease in agriculture production			

No.	Problems	Better	Unchanged	Worse
7	Disaster (flood, drought,...)			
8	Agricultural Extension Services			

1. Other activities in the last month,

No.	Activities	Often	Sometime	Rarely	Never
1	Reading magazine, book				
2	Watching television				
3	Listening radio				
4	Traveling				
5	Going to pagoda/ church				
6	Joining in festival				
7	Other				

Note: Everyday watching TV, listening to radio, reading magazine, book is considered often; other activities happen every month to be considered often. From this, giving a conclusion for other cases)

E- HEALTH

1. Have had problem related to health during last 12 months in your family?

1. Yes
2. No → Moving to question D10

2. If any, which disease?

1. Flu
2. Respiratory illness
3. Malaria
4. Cholera/ Dysentery
5. Hepatitis
6. Poison
7. Accident

8. Other:

3. Where to cure? (choose many options)

- | | |
|----------------------|---|
| 1. Commune station | 2. Pharmacy |
| 3. Surgery | 4. Oriental Medicine |
| 5. District hospital | 6. Herbal/traditional treatment by local medicine |
| 7. Province Hospital | 8. Other: |
| 9. National Hospital | 10. No response |
| 11. Health clinic | |

4. Currently, which factors effect on people's health?

1. Unsafe foods and vegetables
2. Polluted domestic water
3. Salt intrusion
4. Scare domestic water
5. Polluted environment/noise
6. Epidemics

Other:

F-PRODUCTION ACTIVITIES

1. Land use status of household

Land category/use	Area in project site (m ²)	Land use Right certificate 1. Yes 2. Not yet	Other places (renting land)(m ²)	Land use Right certificate 1. Yes 2. Not yet
Residential land				
Garden land				
Paddy-field				
Aquaculture land				

Forestry land				
Industry land (salt, ...)				

2. Do you have plans for economic activities in next 1 or 2 years? (can choose many options)

1. Maintaining the production activities
2. Widen the production and business model
3. Narrow down the production and business model
4. Stopping the production and business models
5. Converting the production and business models
6. No idea

2.b. If having some changes, giving reasons

.....

3. Do you have plans now of how you will replace the income/food production from the agriculture land and/or business that will be recovered? (choose one OR many options)

1. Continuing the old job
2. Restart business in a new location
3. Find a job
4. No yet decided
5. Other (please, describe):.....

4. Obtained loan?

1. Yes withVND
2. No =>moving question 10

5. If productive land is recovered by irrigation project, do you change in obtained loans?

1. Yes 2. No

6. If any, how to change?

1. Increase 2. Unchanged 3. Reduce 4. No answer

7. Which organizations did you lend money?

8. Form of loans

1. Mortgage 2. Unsecured loan 3. Both of them

9. Purpose of loans (*describe*)

- | | |
|------------------------------|---|
| 1. Agriculture production | 8. Investing in small business/services |
| 2. Raising livestock | 9. Health care |
| 3. Aquaculture | 10. Education |
| 4. Reforestation | 11. Buying productive land |
| 5. Handicraft | 12. Buying residential land |
| 6. Buying permanent facility | 13. Construction |
| 7. Daily expenses | 14. Other (<i>describe</i>):..... |

10. Why have you not lent money for 12 months? (choose 1 option)

- | | |
|----|--|
| 1. | No demand |
| 2. | Need capital, but not known loan source |
| 3. | Need capital, not loan source |
| 4. | Have demand, but not enough condition (<i>describe</i>)
..... |
| 5. | Other
reason(<i>describe</i>)..... |

11. Who can support (financial/spirit)? (*choose 3 options*)

Financial	Spirit
1. Parents	1. Parents
2. Sibling	2. Sibling
3. Daughters and sons	3. Daughters and sons
4. Relative	4. Relative
5. Neighbors	5. Neighbors
6. Friends	6. Friends
7. Unions	7. Unions

8. No one	8. No one
9. Other (<i>describe</i>):	9. Other (<i>describe</i>):

12. How do you intend to use the money that you will receive for the compensation of your land? (*choose many options*)

1. Buy new land for agriculture production	8. Save in the bank
2. Buy new residential land	9. Repayment
3. Built house	10. Daily expenses
4. Renovate house	11. Buy other type of asset
5. Invest in small business, services, non-agriculture	12. Health care
6. Invest in agriculture, reforestation, aquaculture	13. Spend on children's education
7. Join in vocational training (<i>non-agriculture</i>)	14. Distribution for their children and relative
	15. Other (<i>describe</i>)...

G-PROBLEMS RELATED TO PROJECT

1. Salt intrusion into the water for agriculture.

1. Yes, throughout the year
2. Yes, depend on the season
3. *No salt intrusion* → **move to G3**

2. Affected of salt water on:

	Positive	Negative	Not effect	No idea
1. Change the production season				
2. Effect on agriculture production				
3. Effect on living condition				
4. Effect on people's health				
5. Irrigation fee				
6. Other (<i>describe</i>)				

3. From 2010, Which hazard did you face?

	Yes	No
- Natural disaster	1 <input type="checkbox"/>	2 <input type="checkbox"/>
- Epidemic	1 <input type="checkbox"/>	2 <input type="checkbox"/>
- Salt intrusion	1 <input type="checkbox"/>	2 <input type="checkbox"/>
- Polluted environment	1 <input type="checkbox"/>	2 <input type="checkbox"/>
- Loss of land	1 <input type="checkbox"/>	2 <input type="checkbox"/>
- Unemployment	1 <input type="checkbox"/>	2 <input type="checkbox"/>
- Other:	1 <input type="checkbox"/>	2 <input type="checkbox"/>

4. G3. Have you known about climate change, sea level rise?

1. Yes
2. No
3. No idea → *Move to G7*

5. Which source have you known about climate change, sea level rise ?

1. Internet
2. Village loudspeaker
3. Community activities
4. Neighbor
5. Television
6. Banner
7. Wife/Husband
8. Friend
9. Magazine
10. Leaflets
11. Relative
- Other source

6. Do you know that irrigation project will implement?

1. Yes (*Describe:.....*)
2. No *Move question 8*

7. If any, which source? (Can choose many option and circling)

1. Disseminated village meetings
2. Disseminated commune meetings
3. Watch TV/Listen to radio/Read the magazine
4. Village loudspeaker`
5. Officer and union
6. Wife/Husband
7. Relative
8. Friend/neighbor
9. Other (describe):.....

8. Which positive effects have irrigation work brought?

	Yes	No
– Prevent salt intrusion,	<input type="checkbox"/>	<input type="checkbox"/>
– Active water for irrigation	<input type="checkbox"/>	<input type="checkbox"/>
– Restoration the ecological environment	<input type="checkbox"/>	<input type="checkbox"/>
– Complete the transport infrastructure in rural area	<input type="checkbox"/>	<input type="checkbox"/>
– Convenience for travelling and goods traffic	<input type="checkbox"/>	<input type="checkbox"/>

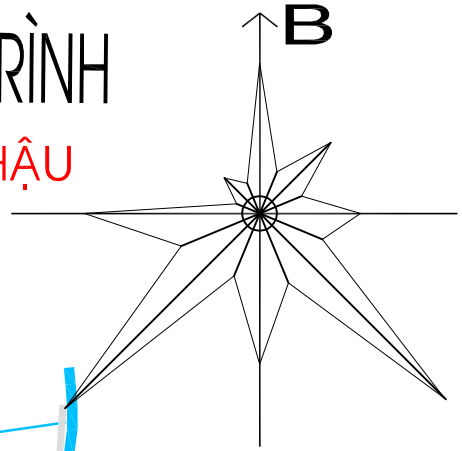
9. Which negative effects, have irrigation brought?

	Yes	No
– Difficulty for agriculture production	<input type="checkbox"/>	<input type="checkbox"/>
– Local polluted environment	<input type="checkbox"/>	<input type="checkbox"/>
– Ecological environment change	<input type="checkbox"/>	<input type="checkbox"/>
– Impeding flood drainage	<input type="checkbox"/>	<input type="checkbox"/>
– Impeding boat travelling	<input type="checkbox"/>	<input type="checkbox"/>

Thanks for your cooperation!

APPENDIX 3: LAYOUTS AND MAPS RELATED TO THE SUBPROJECT

BẢN ĐỒ HỆ THỐNG SÔNGNG KÊNH CÁC HUYỆN/THỊ VÙNG TDA VÀ BỐ TRÍ CÔNG TRÌNH
TIỂU DỰ ÁN NÂNG CAO KHẢ NĂNG THOÁT LŨ VÀ PHÁT TRIỂN SINH KẾ BỀN VỮNG THÍCH ỨNG KHÍ HẬU
CHO VÙNG ĐỒNG THÁP MƯỜI (CÁC HUYỆN THỊ PHÍA BẮC TỈNH ĐỒNG THÁP)

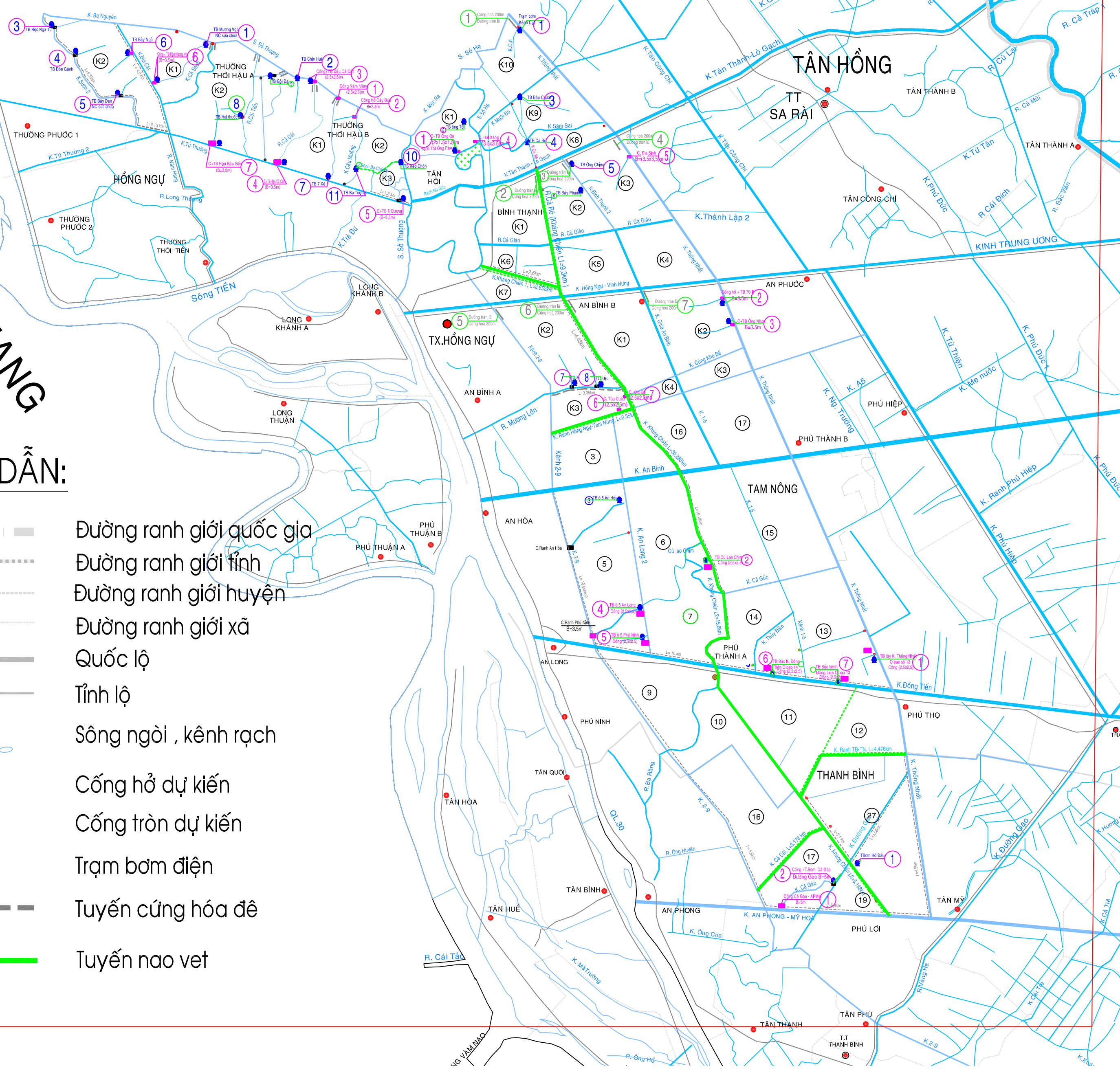


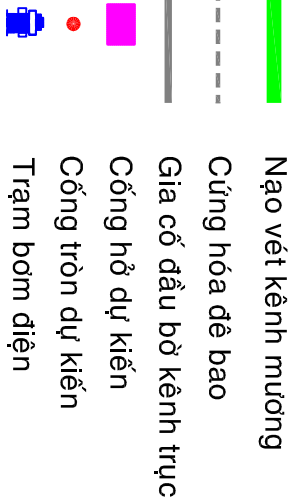
CAM PU CHIA

TỈNH AN GIANG

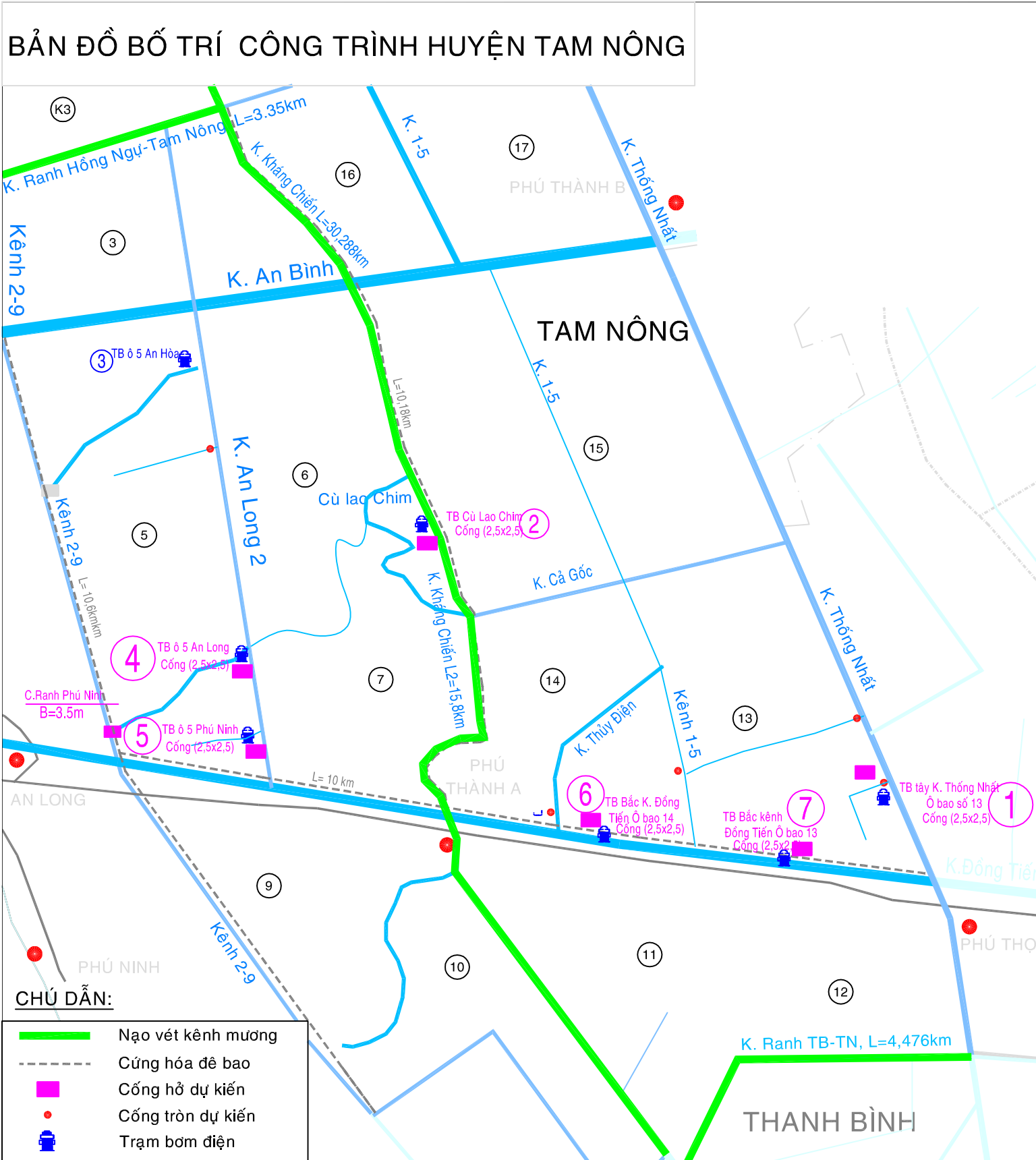
CHÚ DẪN:

- Đường ranh giới quốc gia
- Đường ranh giới tỉnh
- Đường ranh giới huyện
- Đường ranh giới xã
- Quốc lộ
- Tỉnh lộ
- Sông ngòi , kênh rạch
- Cống hở dự kiến
- Cống tròn dự kiến
- Trạm bơm điện
- Tuyến cứng hóa đê
- Tuyến nao vet

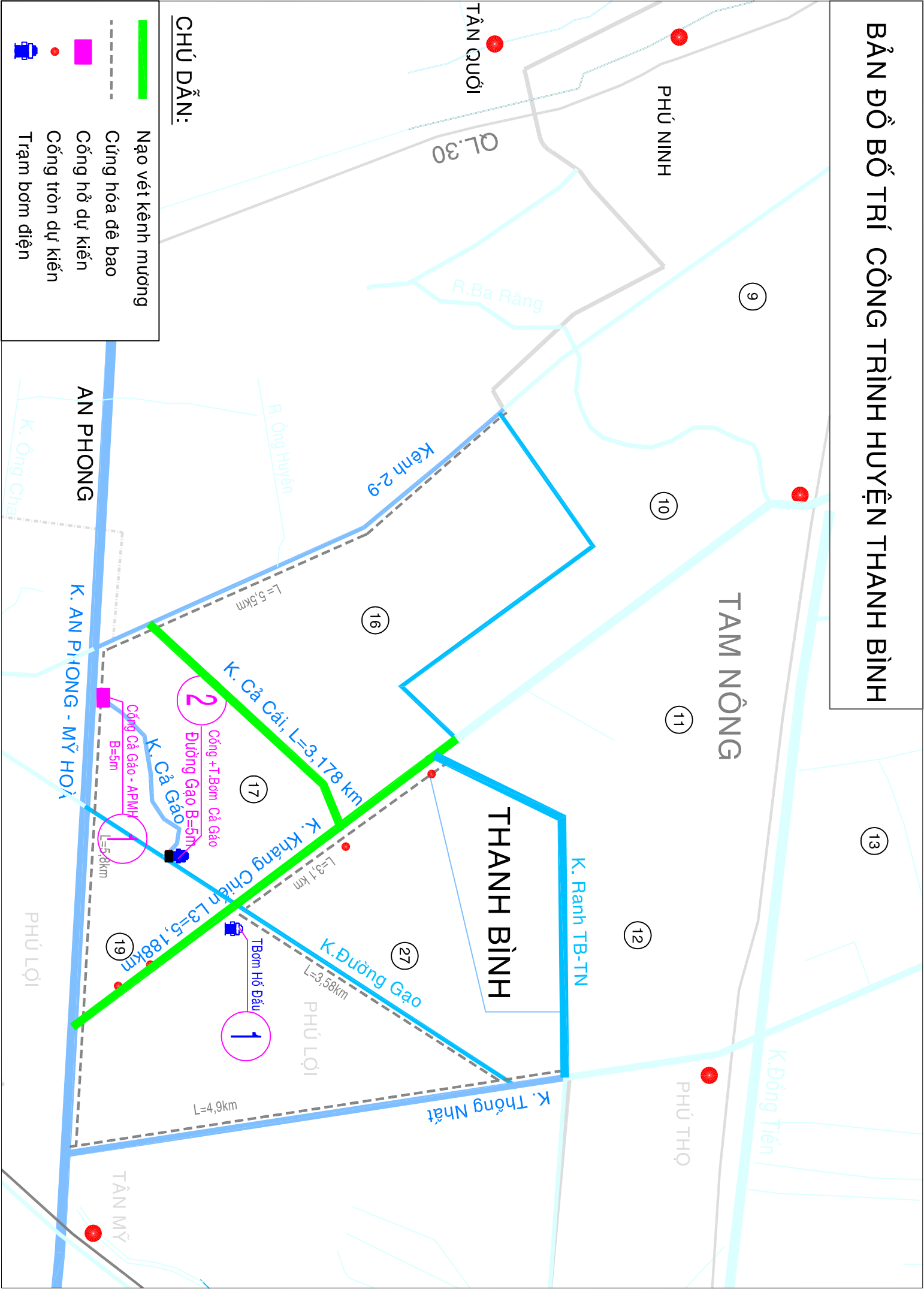




BẢN ĐỒ BỐ TRÍ CÔNG TRÌNH HUYỆN TAM NÔNG

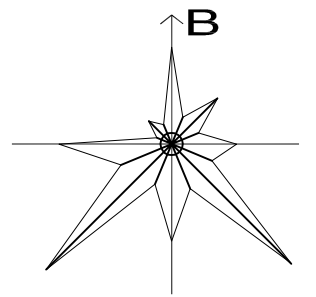


BẢN ĐỒ BỒ TRÍ CÔNG TRÌNH HUYỆN THANH BÌNH



BẢN ĐỒ BỐ TRÍ VÙNG NUÔI VÀ CÁ C MÔ HÌNH SINH KẾ

TIỂU DỰ ÁN NÂNG CAO KHẢ NĂNG THOÁT LŨ VÀ PHÁT TRIỂN SINH KẾ BỀN VỮNG THÍCH ỨNG KHÍ HẬU
CHO VÙNG ĐỒNG THÁP MƯỜI (CÁC HUYỆN THỊ PHÍA BẮC TỈNH ĐỒNG THÁP)



TỈ LỆ

CAM PU CHIA

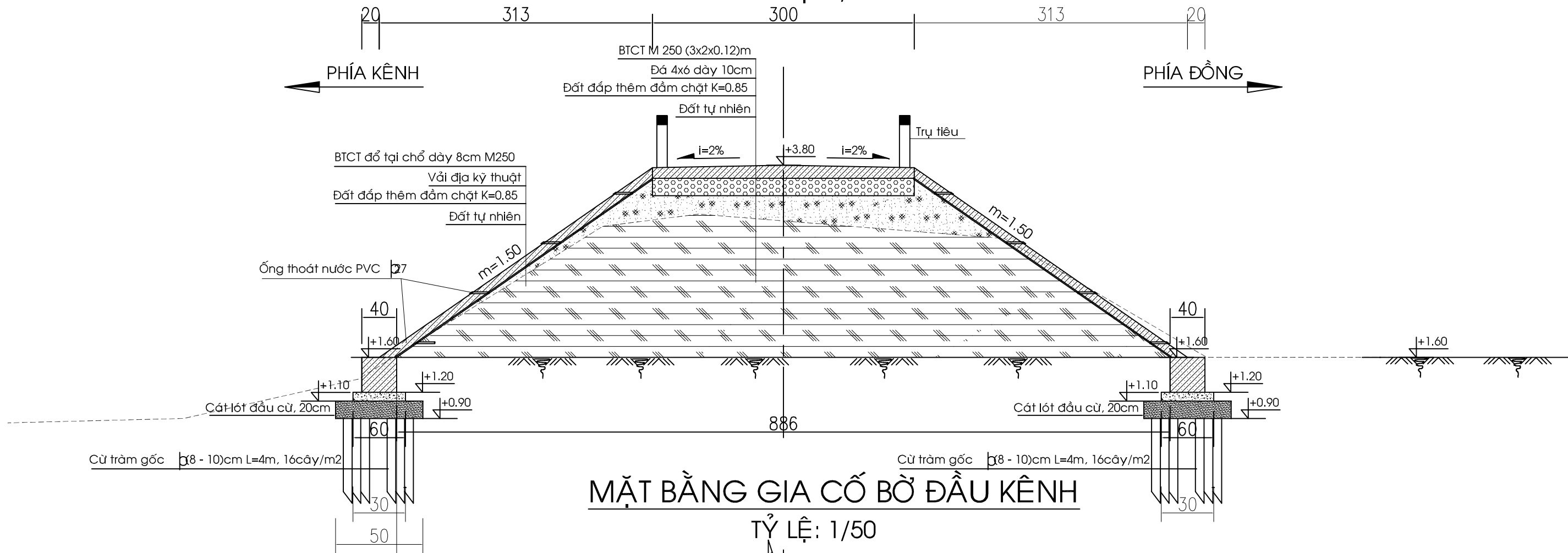
TỈNH AN GIANG

CHÚ DẪN:

- Đường ranh giới quốc gia
- Đường ranh giới tỉnh
- Đường ranh giới huyện
- Đường ranh giới xã
- Quốc lộ
- Tỉnh lộ
- Sông ngòi , kênh rạch
- Cống hở dự kiến
- Cống tròn dự kiến
- Trạm bơm điện
- Tuyến cứng hóa đê
- Vùng SX lúa - cá TN
- Vùng SX lúa - Tôm càng xanh
- Vùng SX lúa - màu-cá TN
- Vùng SX sen - cá TN
- Vùng SX lúa -màu (ớt bắp..) - cá TN

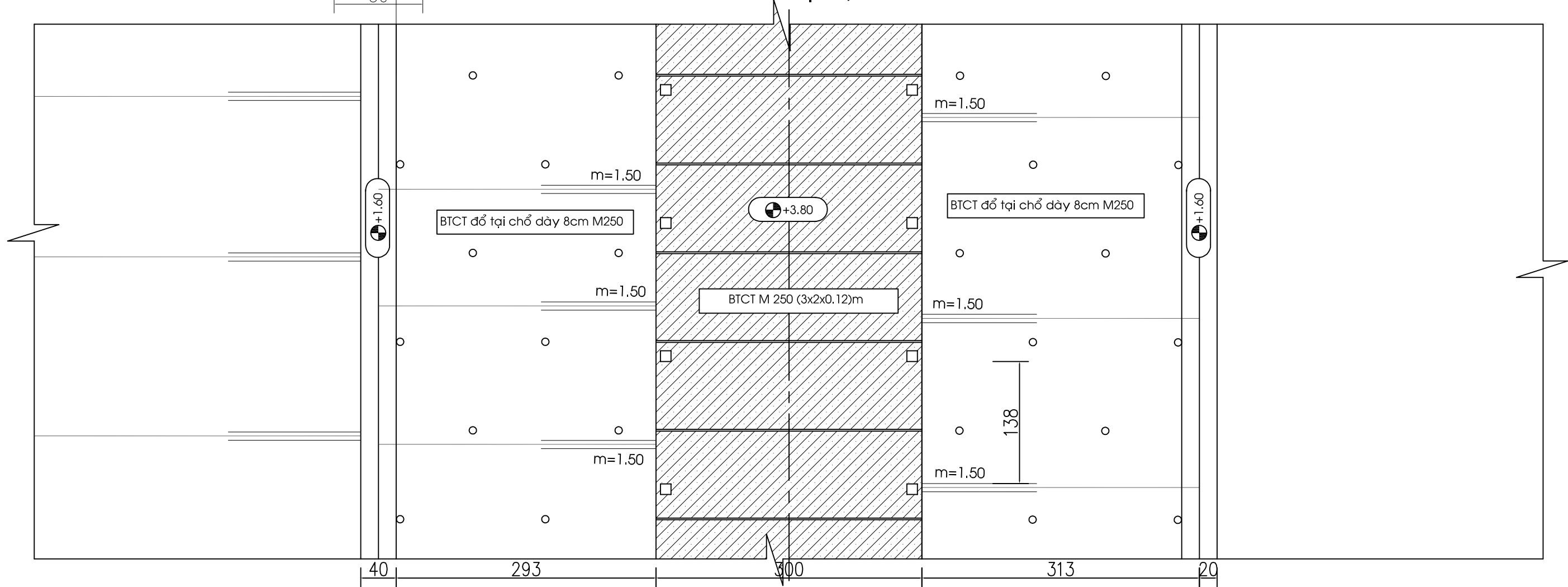
MẶT CẮT NGANG GIA CỐ BỜ ĐẦU KÊNH

TỶ LỆ: 1/50



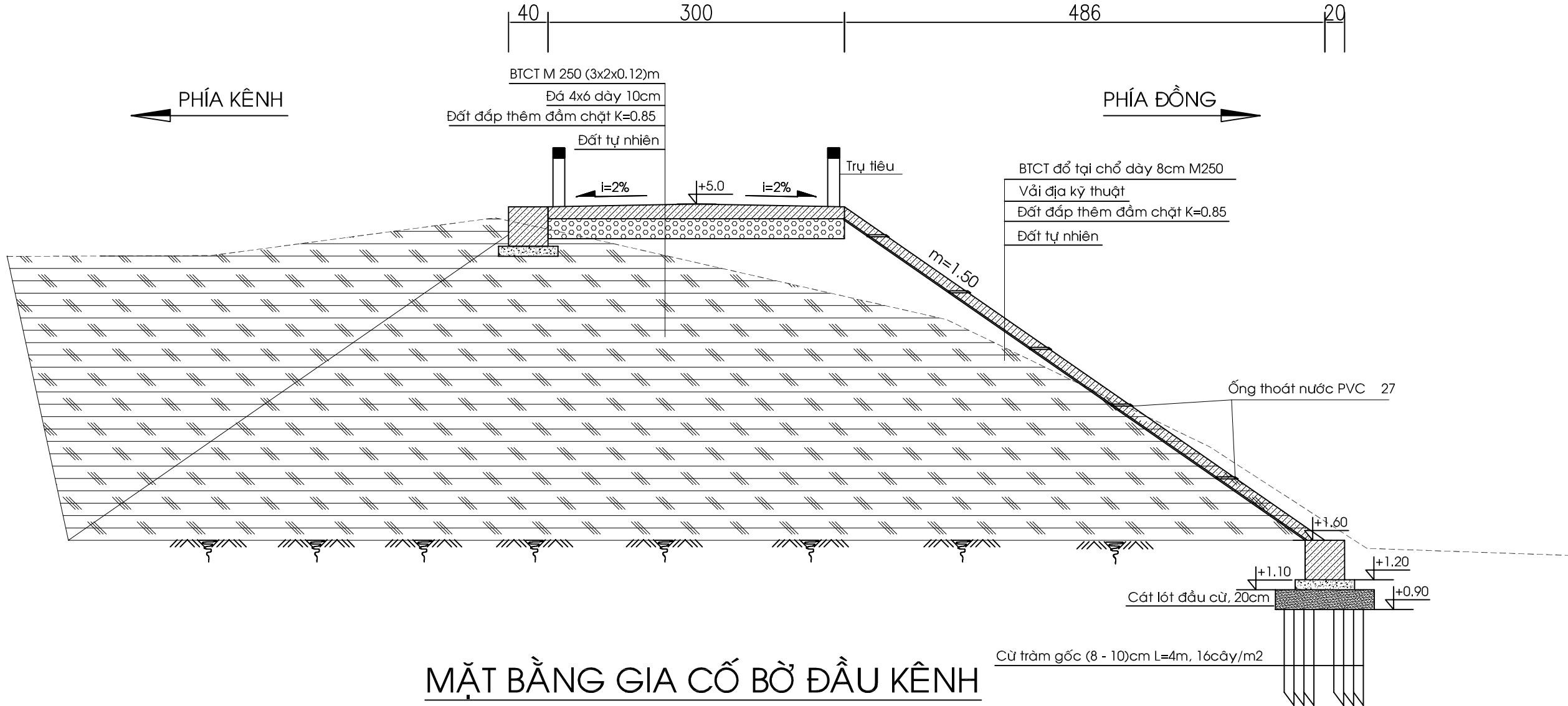
MẶT BẰNG GIA CỐ BỜ ĐẦU KÊNH

TỶ LỆ: 1/50



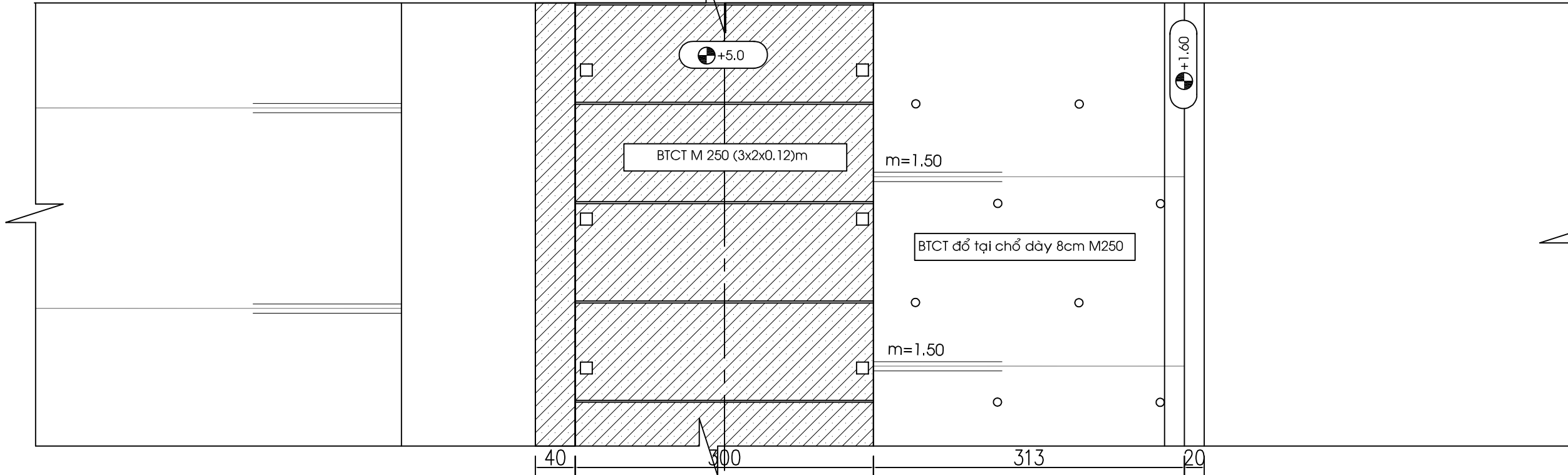
MẶT CẮT NGANG GIA CỐ BỜ ĐẦU KÊNH

TỶ LỆ: 1/50



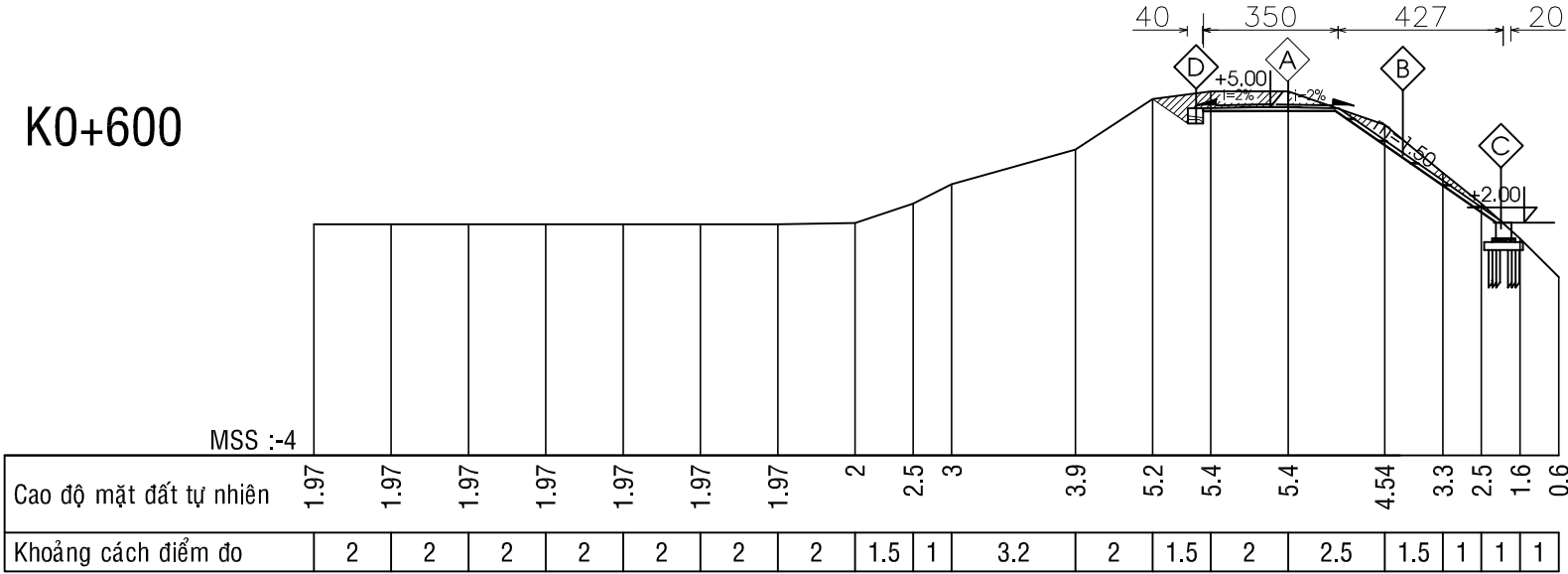
MẶT BẰNG GIA CỐ BỜ ĐÀU KÊNH

TỶ LỆ: 1/50



MCN CỨNG HÓA KÊNH SƯỜN 2

K0+600

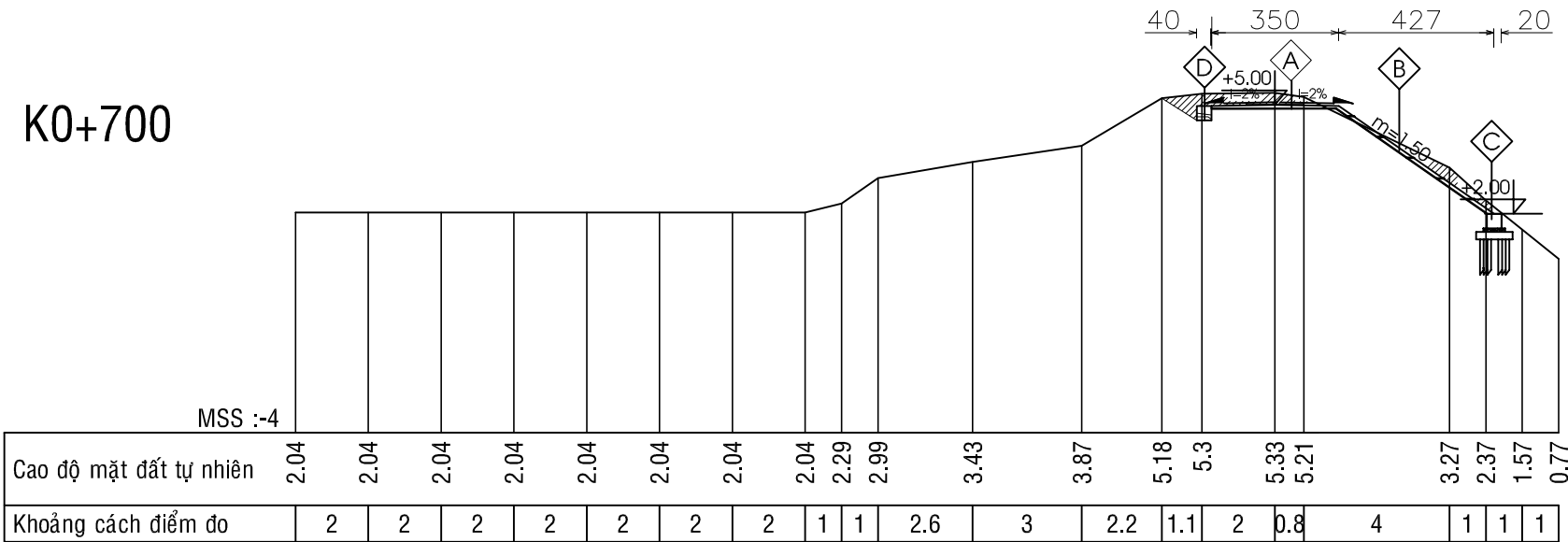


TT	Hạng mục	Đơn vị	Diện tích
1	S đất đào	m ²	1,560
2	S đất đắp	m ²	0,000

- A

Tấm đan đường BTCT đá 1x2 M250, KT(3.0x2x0.12)m
Vải nylon chống mất nước XM
Đất đắp thêm đầm chặt K=0.85
Đất tự nhiên

K0+700

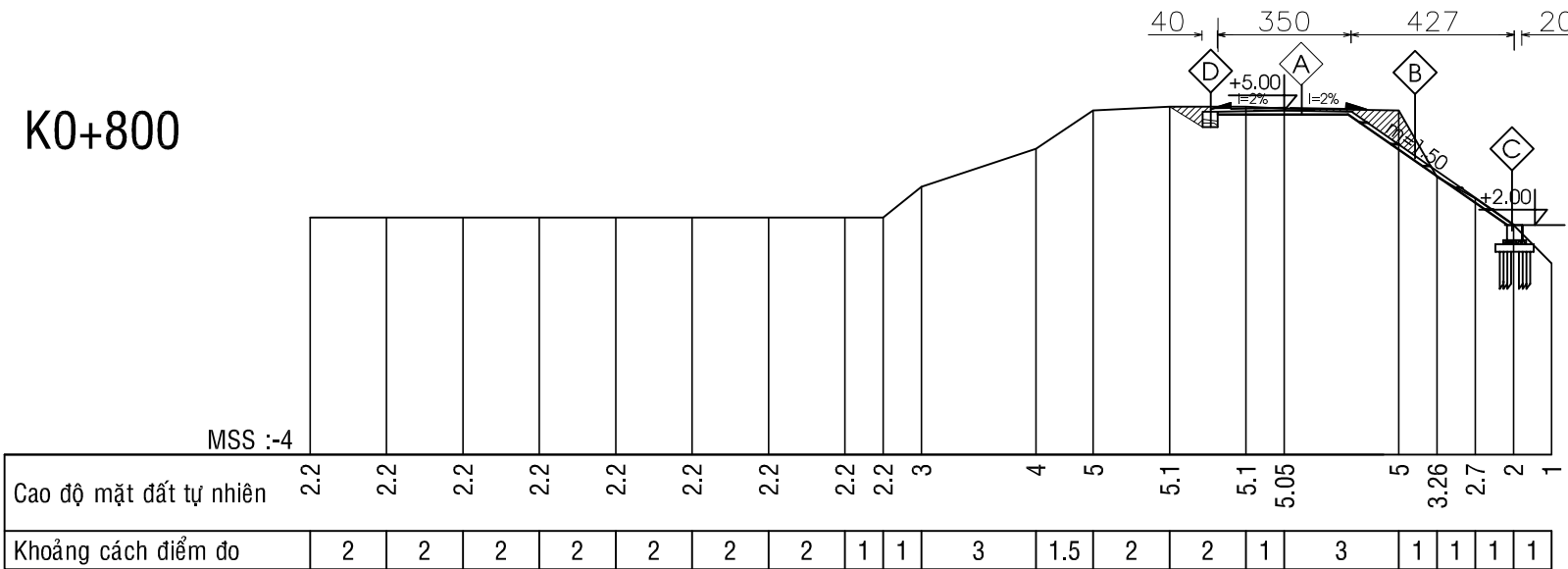


TT	Hạng mục	Đơn vị	Diện tích
1	S đất đào	m ²	1,395
2	S đất đắp	m ²	0,000

- B

Tấm đan mái BTCT đá 1x2 M250, dày 8cm
Ống PVC D42mm thoát nước mái, CK1m/ống
Vải nylon chống mất nước XM
Đất đắp thêm đầm chặt K=0.85
Đất tự nhiên

K0+800



TT	Hạng mục	Đơn vị	Diện tích
1	S đất đào	m ²	1,393
2	S đất đắp	m ²	0,000

- C

Dầm móng BTCT đá 1x2 M250, KT 40x40cm
Bê tông lót đá 1x2 M150, rộng 30cm, dày 10cm
Cừ tràm gốc d=8-10 L=3.8m, 16 cây/m2
Đất tự nhiên
- D

Đá hộc xây kích thước 40x40cm

- Đất đào
- Đất đắp

1/2 A-A

TỈ LỆ 1:100

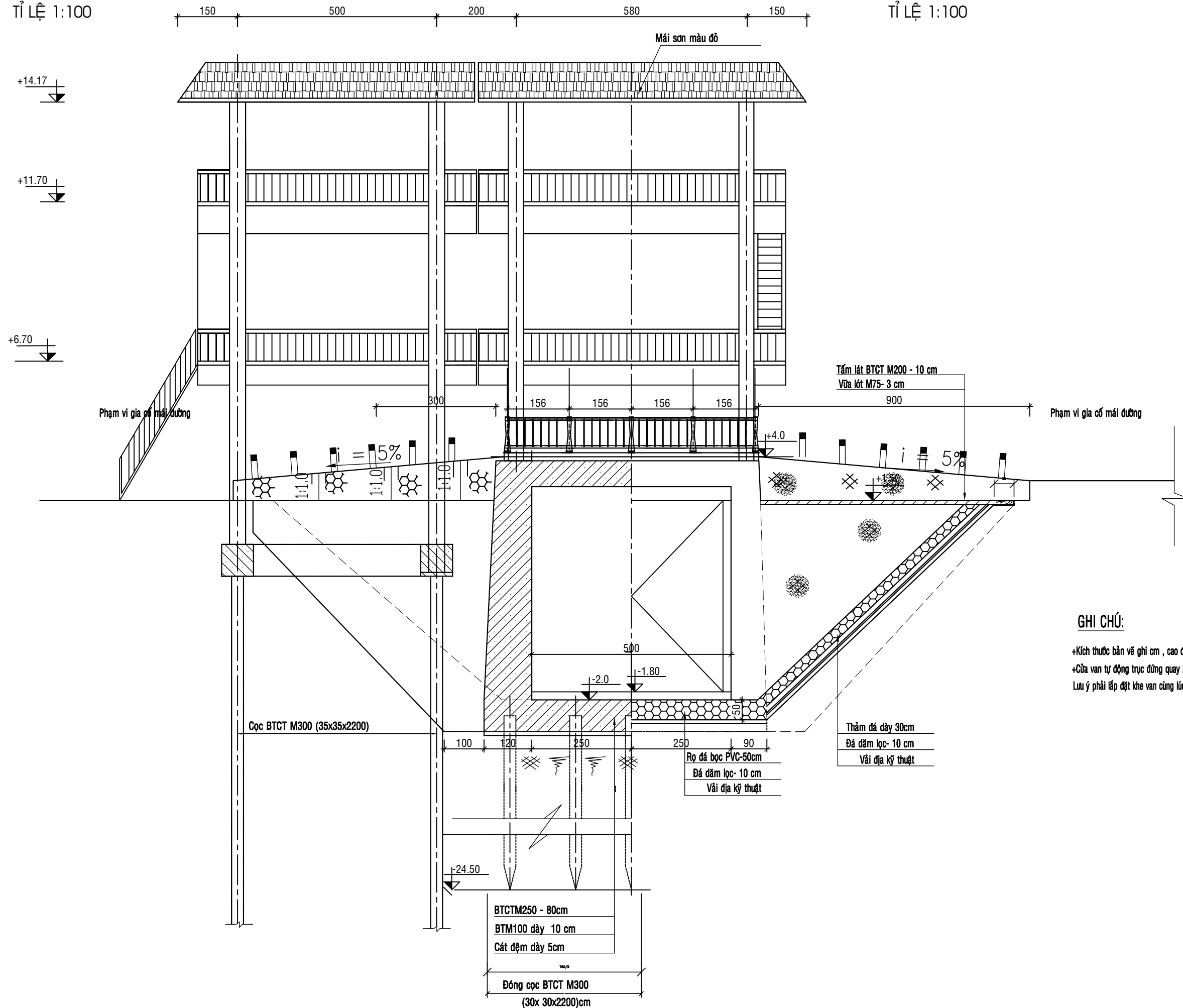
CHÍNH DIỆN THƯỢNG HẠ LƯU

TL 1:100

1/2 B-B

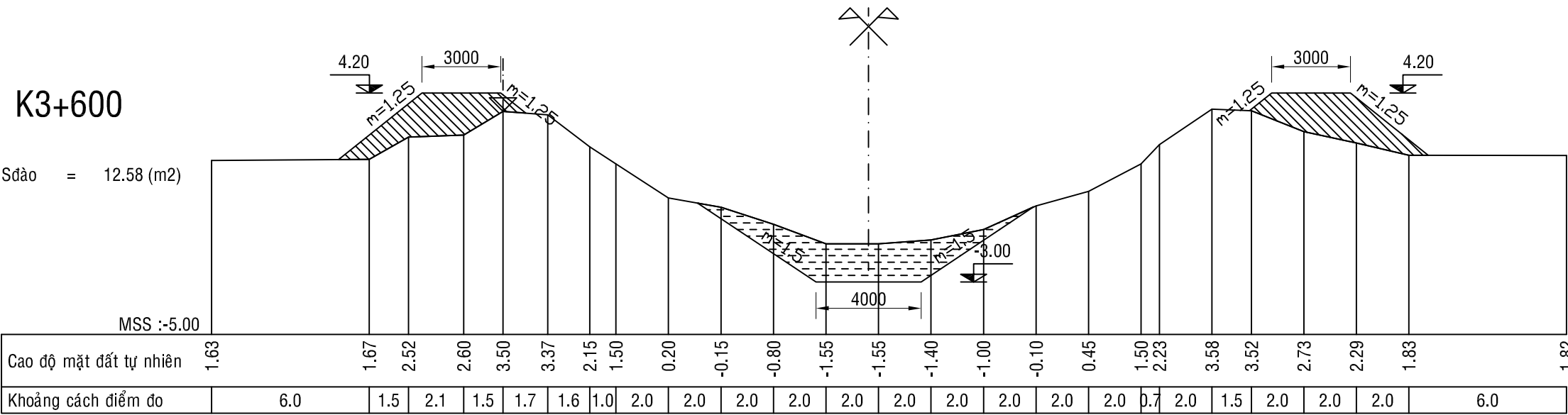
TỈ LỆ 1:100

MCN CÔNG B=5,0M



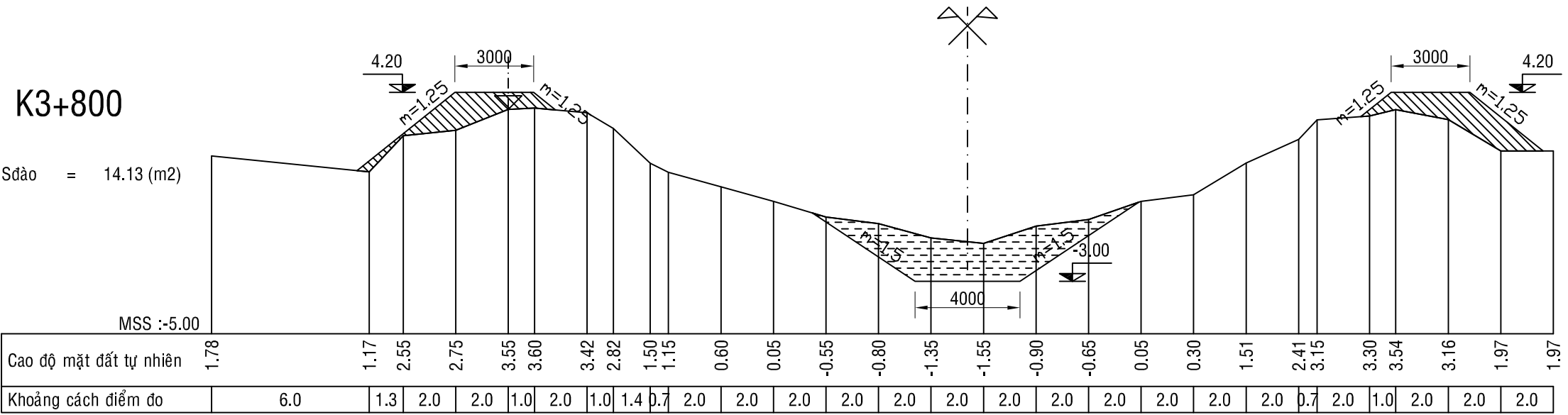
K3+600

Sđào = 12.58 (m2)



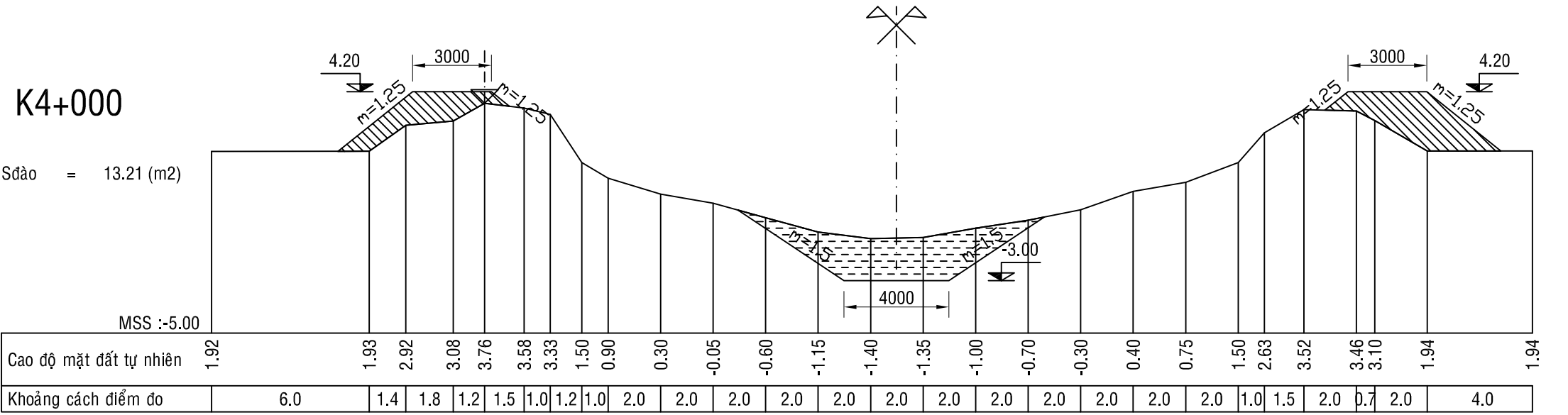
K3+800

Sđào = 14.13 (m2)

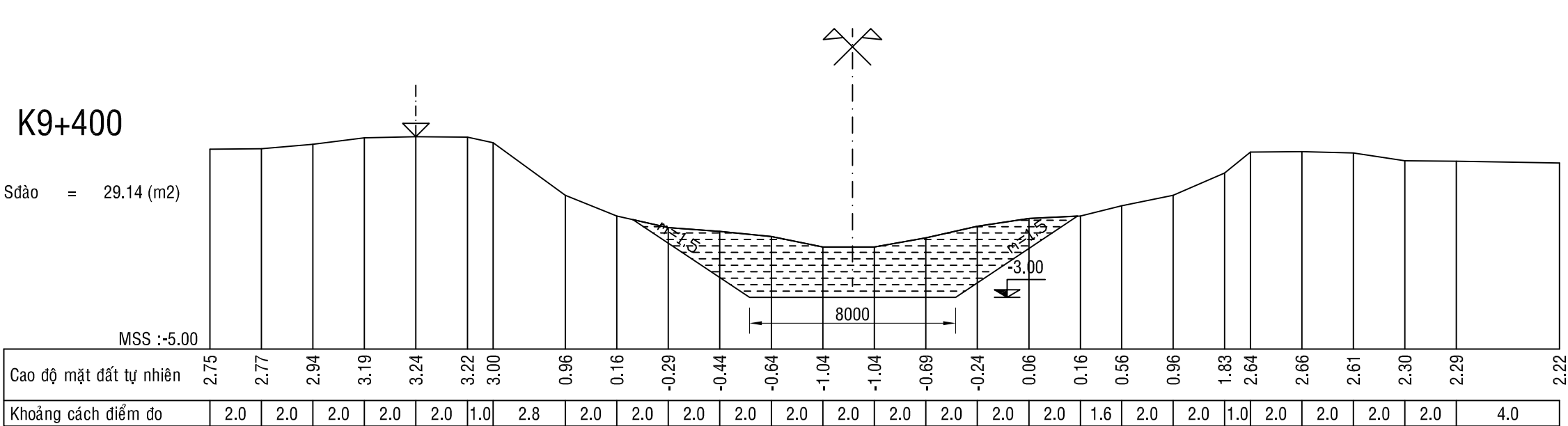
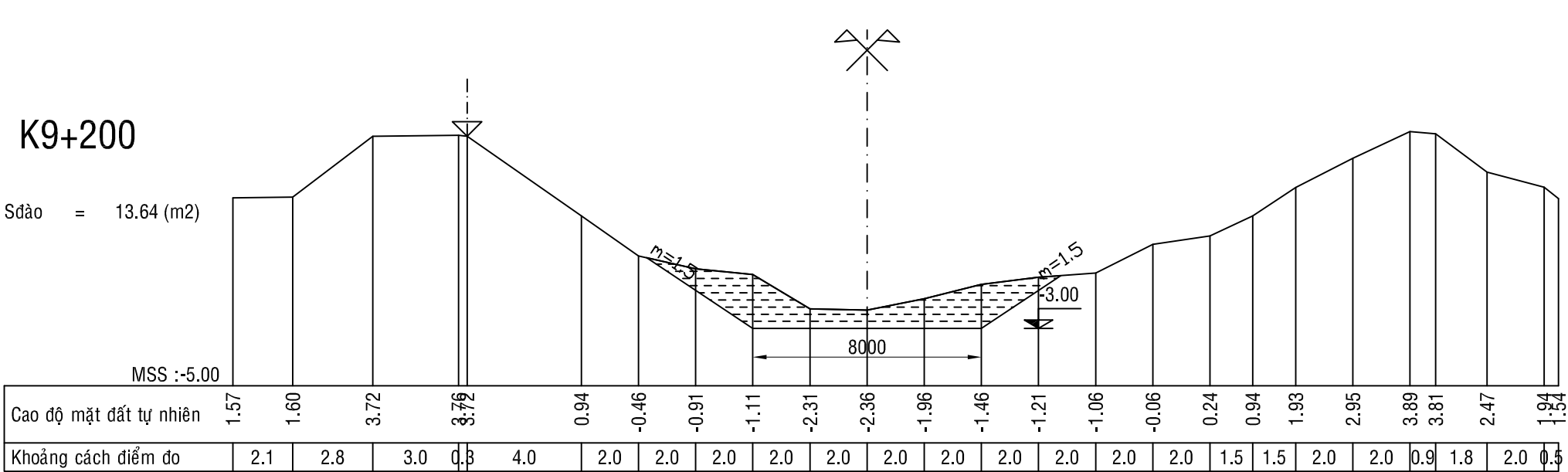
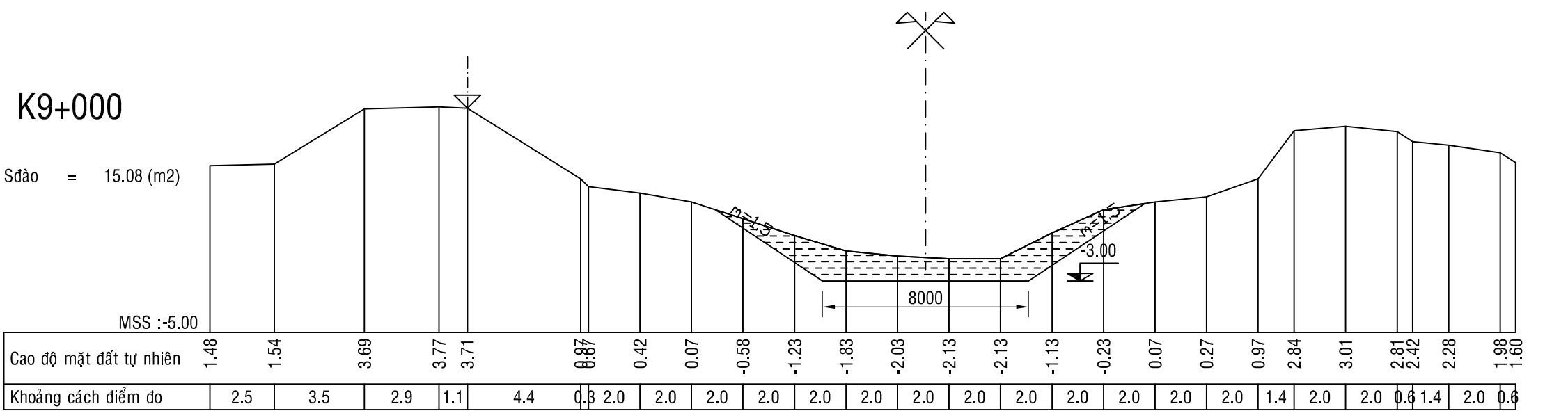


K4+000

Sđào = 13.21 (m2)

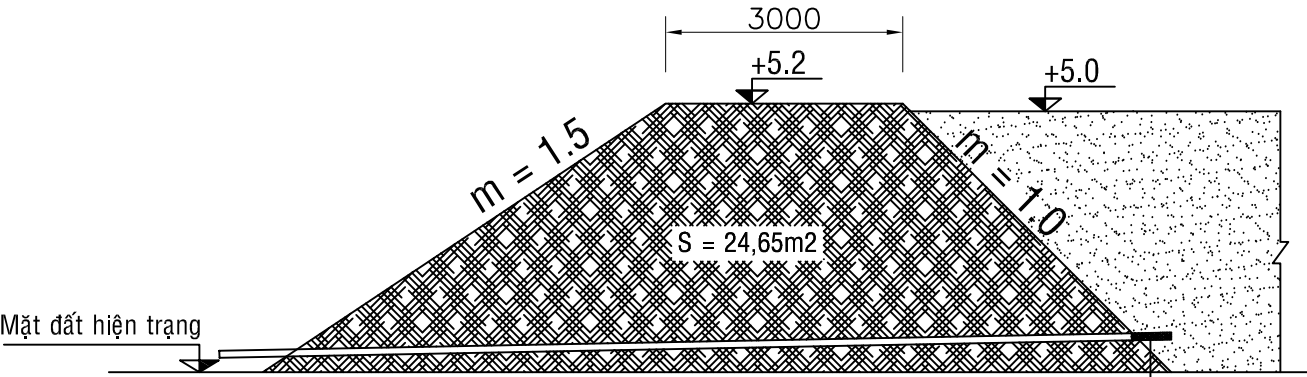


HẠNG MỤC: KÊNH KHÁNG CHIẾN (TỪ KÊNH TÂN THÀNH LÒ GẠCH ĐẾN KÊNH RANH TX. HỒNG NGỰ - TÂM NÔNG)		
TÊN BẢN VẼ: MẶT CẮT NGANG NẠO VẾT KÊNH (PA XÁNG CẠP)		
TỶ LỆ: 1/200	SỐ HIỆU BẢN VẼ ICRSL-K.KC-MCN-02	
TỔNG SỐ BẢN VẼ	02/04	SIZE A3



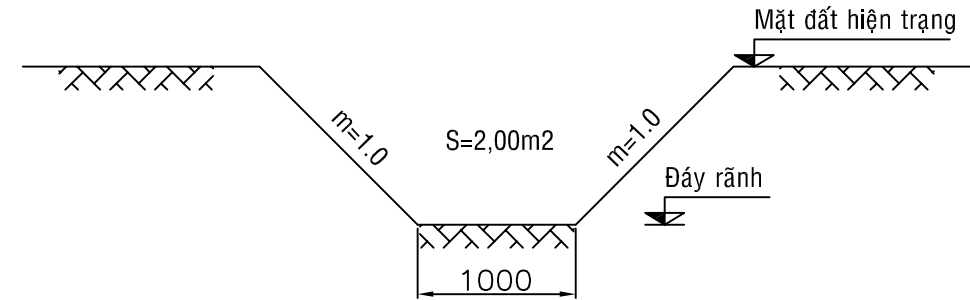
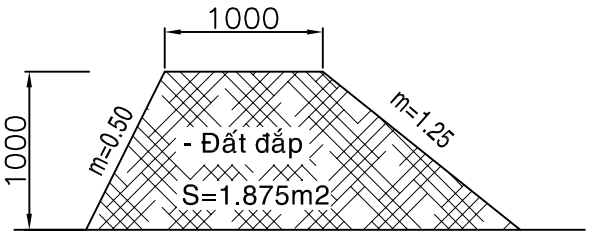
HẠNG MỤC: KÊNH KHÁNG CHIẾN (TỪ KÊNH TÂN THÀNH LÒ GẠCH ĐẾN KÊNH RANH TX. HỒNG NGỰ - TÂM NÔNG)		
TÊN BẢN VẼ: MẶT CẮT NGANG NẠO VẾT KÊNH (PA XÁNG THÔI)		
TỶ LỆ: 1/200	SỐ HIỆU BẢN VẼ ICRSL-K.KC-MCN-03	
TỔNG SỐ BẢN VẼ	03/04	SIZE A3

MẶT CẮT ĐẠI DIỆN BỜ CHẶN KHU CHỨA ĐẤT L=600m
TỶ LỆ 1/100



ỐNG PVC Ø100MM, ĐỤC THÊM CÁC LỖ BÊN Ø10MM
ĐỤC 4 HÀNG LỖ DỌC, MỖI HÀNG 4 LỖ, KHOẢNG CÁCH LỖ 10CM
KHOẢNG CÁCH ĐẶT ỐNG : 20M
VẢI ĐỊA KỸ THUẬT BỊT ĐẦU ỐNG QUI CÁCH 0.6mX0.6m
DÙNG DÂY CAO SU BƯỚC CHẶT VẢI VÀO ỐNG

MẶT CẮT BỜ CHẶN ĐẤT VÀO RUỘNG
TỶ LỆ : 1/50



MẶT CẮT ĐẠI DIỆN RÃNH THOÁT NƯỚC L= 2x50M
TỶ LỆ 1/50

BIỆN PHÁP THI CÔNG :

Đoạn từ K0+000 đến K4+100 :

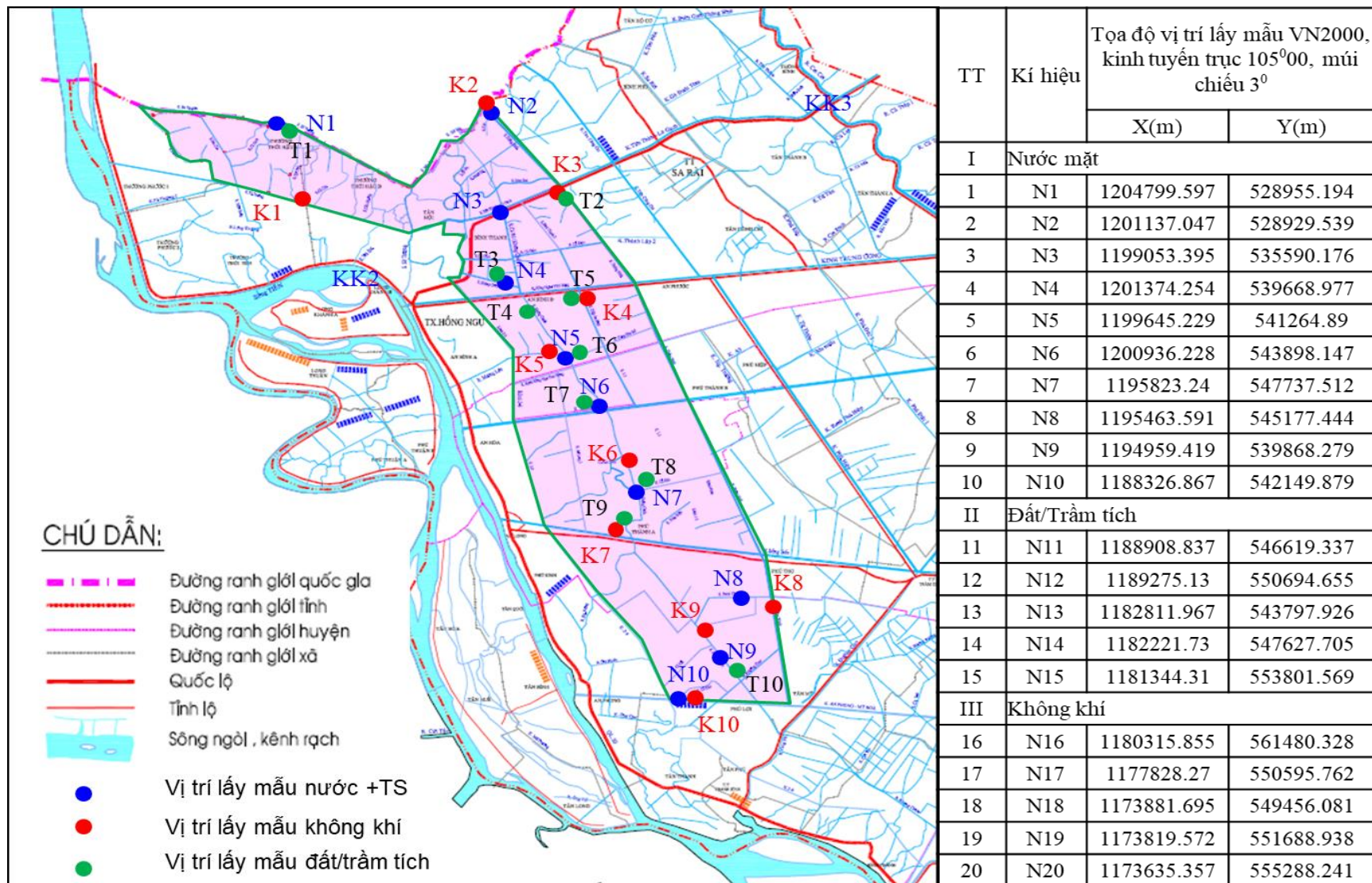
- Giải phóng mặt bằng hai bên bờ kênh;
- Đắp bờ chặn phía đồng dọc theo tuyến bằng máy đào gàu 0,8m³;
- Nạo vét kênh bằng máy đào gàu ≤1,2m³;
- Tu sửa, bạt mái hoàn thiện bờ bao.

Đoạn từ K4+100 đến K9+300

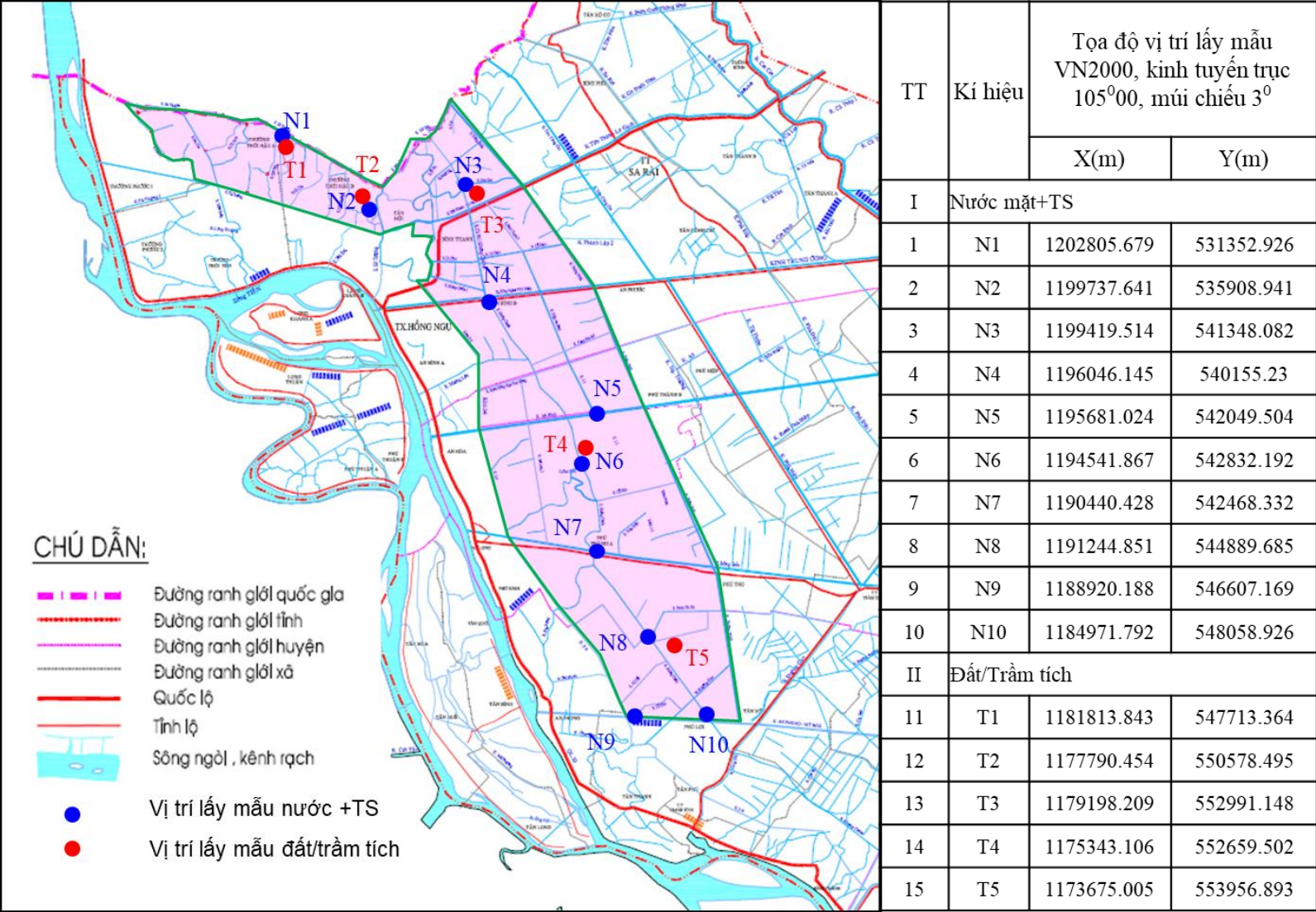
- Giải phóng mặt bằng các khu chứa đất;
- Đắp bờ chặn tại bãi chứa bằng máy đào gàu 0,8m³;
- Lắp đặt ống nhựa thoát nước đường kính ống d=114mm.
- Đào rãnh thoát nước bằng máy đào gàu 0,8m³.
- Nạo vét bùn bằng tàu hút công suất ≤2000CV, chiều cao ống xả ≤5m, chiều dài ống xả ≤1700m từ nơi vị trí nạo vét đến bãi chứa đất.

HẠNG MỤC: KÊNH KHÁNG CHIẾN (TỪ KÊNH TÂN THÀNH LÒ GẠCH ĐẾN KÊNH RANH TX. HỒNG NGỰ - TÂM NÔNG)		
TÊN BẢN VẼ: <u>MẶT CẮT BỜ CHẶN</u> <u>MẶT CẮT RÃNH THOÁT NƯỚC</u>		
TỶ LỆ: THEO BV	SỐ HIỆU BẢN VẼ ICRSL-K.KC-MCN-04	
TỔNG SỐ BẢN VẼ	04/04	SIZE A3

BẢN ĐỒ VỊ TRÍ GIÁM SÁT MÔI TRƯỜNG GIAI ĐOẠN THI CÔNG



BẢN ĐỒ VỊ TRÍ GIÁM SÁT MÔI TRƯỜNG GIAI ĐOẠN HOẠT ĐỘNG



**APPENDIX 4: ANALYSIS RESULTS OF EXISTING
ENVIRONMENTAL QUALITY**

**SOUTHERN INSTITUTE OF WATER RESOURCES RESEARCH
CENTER FOR ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY**



Address: 658 Vo Van Kiet Street, District 5, Ho Chi Minh City, Vietnam

Tel: 84 28 39233700 – 84 28 39244286 Fax: 84 28 39235028

Email: ceste.siwrr@gmail.com

No: ĐT1/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject “Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)”

Type of sample: Air

Time of sampling: 05/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 23/05/2017

No.	Label of air samples	Temp.	Dust	NO ₂	SO ₂	CO	Noise		
		⁰ C	$\mu\text{g}/\text{m}^3$				Medium	Max	Min
			$\mu\text{g}/\text{m}^3$				dBA		
1	KK1	31.8	89	21	15	160	52.3	62.1	36.4
2	KK2	30.7	110	20	23	240	60.3	68.9	47.8
3	KK3	31.3	86	29	18	320	55.4	67.1	41.4
4	KK4	30.9	130	32	21	410	53.4	68.4	39.3
5	KK5	30.8	78	16	17	540	60.5	67.1	46.5
6	KK6	31.2	67	19	16	430	61.2	65.6	43.4
7	KK7	30.8	92	21	23	280	55.7	67.1	38.2
8	KK8	31.1	100	25	21	330	59.4	63.2	45.1
9	KK9	30.8	110	38	24	360	53.3	68.1	40.6
10	KK10	30.9	83	17	18	200	54.3	69.4	42.2

Manager of lab.

Dong Thi An Thuy

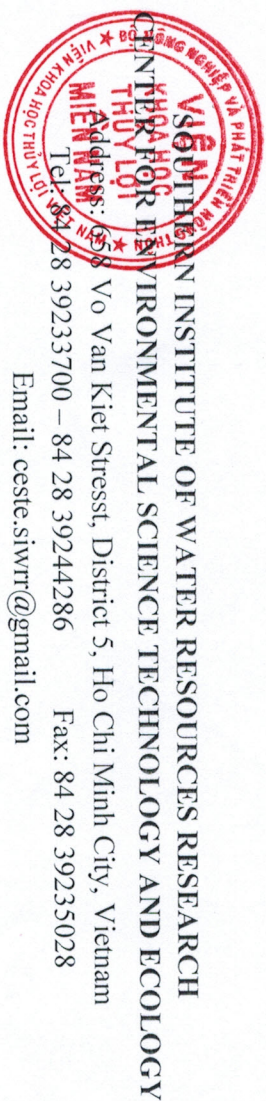
Manager of CESTE

Vu Nguyen Hoang Giang

By order Director of SIWRR



Duong Xuan Minh



Email: ceste.sivwr@gmail.com

No: DT2/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject "Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)"

Type of sample: Surface water

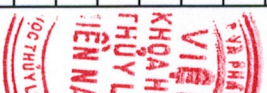
Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 20/08/2017

No.	Label of water samples	Tide	Temp.	pH	EC	Salinity	Turbidity	DO	COD	BOD ₅	TSS	TDS	TP	TN
			°C		μS/cm	‰								
1	N1	High	30.5	7.09	237	0.0	125	4.8	17	9.1	117.9	173.5	0.040	1.92
2		Low	30.3	6.72	201	0.0	142	5.4	17.3	9.7	142.7	139.7	0.084	1.32
3	N2	High	29.8	6.56	237	0.0	82.4	2.8	20.2	11.3	95.7	161	0.290	4.29
4		Low	29.4	6.65	212	0.0	93.7	2.2	17	10	97	145.9	0.360	4.46
5	N3	High	29.9	7.07	281	0.0	139	5.5	17.7	9.5	137	205.1	0.028	2.68
6		Low	29.4	7.14	256	0.0	156	4.7	20.2	11.1	179.1	188.7	0.031	2.85
7	N4	High	29.8	6.8	230	0.0	63.4	3.1	18.9	10.4	68.2	161.7	0.040	2.98
8		Low	29.8	6.93	197	0.0	81.6	2.6	18.5	10.1	85.3	141.1	0.052	3.29
9	N5	High	29.6	6.68	243	0.0	44.3	3.1	21.2	11.7	53.4	167.8	0.230	5.76
10		Low	29.6	6.71	236	0.0	65.2	2.7	21.7	11.8	79.2	163.8	0.200	5.59
11	N6	High	29.7	6.92	240	0.0	54.5	5.5	16.8	9.3	52.6	171.5	0.130	2.76
12		Low	29.8	6.88	207	0.0	62.8	4.8	16.1	8.8	57.5	147.2	0.160	3.03

No.	Label of water samples	Tide	Temp.	pH	EC	Salinity	Turbidity	DO	COD	BOD ₅	TSS	TDS	TP	TN
			°C		μS/cm	‰		NTU	mgO ₂ /L			mg/L		
13	N7	High	29.8	6.48	205	0.0	94.0	3.8	18.9	10.4	101.2	137.6	0.034	3.35
14		Low	29.5	6.53	183	0.0	106.1	3.1	18.5	10.3	112.6	123.7	0.042	3.6
15	N8	High	29.5	6.61	256	0.0	161	2.4	20.8	10.8	179.5	175.2	0.410	5.96
16		Low	29.7	6.75	225	0.0	172	1.9	23.1	13.2	233.1	157.1	0.290	6.18
17	N9	High	29.9	6.59	243	0.0	97.3	3.5	18.4	9.8	98.8	165.7	0.200	4.28
18		Low	29.8	6.47	216	0.0	118.4	4.2	19.3	10.6	129.9	144.7	0.250	4.73
19	N10	High	29.6	6.41	313	0.1	52.5	4.7	21.7	11.8	63.8	207.7	0.054	4.91
20		Low	30.6	6.62	284	0.1	69.5	4.0	19	10.4	74.7	194.5	0.061	4.99
21	N11	High	29.4	6.57	167	0.0	83.6	5.2	19.7	10.6	91.5	113.6	0.170	3.69
22		Low	30.1	6.49	148	0.0	78.5	4.7	18.9	10.4	84.7	99.5	0.220	4.24
23	N12	High	29.2	6.64	100	0.0	107	5.8	13.6	7.1	79.7	68.7	0.240	1.79
24		Low	29.8	6.73	126	0.0	96.2	5.0	12.1	6.8	68.8	87.7	0.230	2.08
25	N13	High	29.6	6.78	279	0.1	78.0	2.7	17.5	9.9	80	195.6	0.053	3.04
26		Low	29.8	6.81	243	0.0	89.1	2.1	16.6	9.4	86.9	171.1	0.067	3.43
27	N14	High	29.8	6.62	297	0.1	65.7	4.5	18.6	10.2	69.3	203.4	0.048	3.84
28		Low	29.7	6.56	271	0.1	89.2	3.9	19.1	10.7	98.2	184	0.055	3.95
29	N15	High	29.3	6.51	316	0.1	83.5	2.0	18.5	10.3	88.5	213	0.037	3.29
30		Low	29.6	6.83	269	0.1	90.4	1.7	19.3	10	93.8	189.9	0.044	3.56
31	N16	High	29.8	6.69	373	0.1	50.3	4.1	19.9	11.5	59.6	258.2	0.035	4.34
32		Low	29.9	6.94	301	0.1	59.2	3.6	20	10.6	65.1	215.8	0.050	4.68
33	N17	High	30.3	6.78	352	0.1	78.1	4.8	18.7	10.2	91.3	235.6	0.037	3.56
34		Low	29.8	6.9	336	0.1	83.9	4.2	19.3	10.7	95.7	227.1	0.059	3.89
35	N18	High	30.4	6.59	378	0.1	34.7	0.7	20.1	10.6	38	257.7	0.036	4.25
36		Low	29.7	6.87	342	0.1	49.7	0.5	20.8	10.9	56.1	242.8	0.043	4.59
37	N19	High	29.7	6.70	358	0.1	147	4.4	19.8	11	166.8	248.1	0.051	3.64
38		Low	29.5	6.79	323	0.1	162.4	3.7	19.5	10.4	174.6	226.7	0.063	3.99



No.	Label of water samples	Tide	Temp.	pH	EC	Salinity	Turbidity	DO	COD	BOD ₅	TSS	TDS	TP	TN
			°C		μS/cm	‰	NTU		mgO ₂ /L			mg/L		
39	N20	High	29.7	6.82	304	0.1	159	5.1	19.9	11.1	182.1	214.3	0.029	2.99
40		Low	30.5	6.77	288	0.1	175.3	4.8	20.5	11.6	209.5	201.6	0.035	3.21

Manager of lab.

[Signature]

Dong Thi An Thuy

Manager of CESTE

[Signature]

Vu Nguyen Hoang Giang

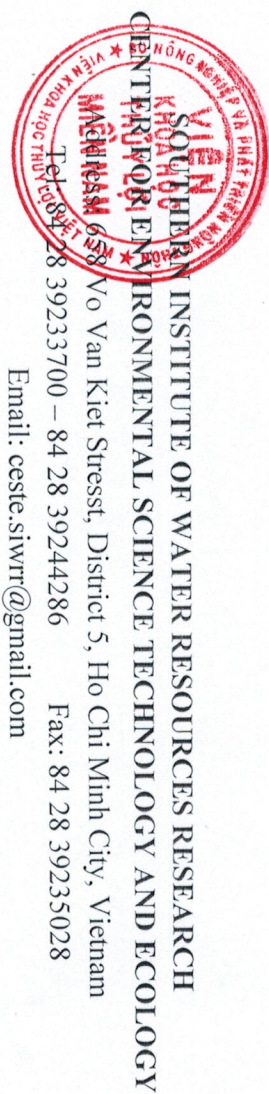


Director of SIWRR

[Signature]

Duong Xuan Minh





Email: ceste.siwrr@gmail.com

No: DT3/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject "Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)"

Type of sample: Surface water

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 20/08/2017

No.	Label of water samples	Tide	mg/L										mg CaCO ₃ /L		MPN/100ml	
			P-PO ₄ ³⁻	N-NH ₄ ⁺	N-NO ₂ ⁻	N-NO ₃ ⁻	Cl ⁻	SO ₄ ²⁻	Ca ²⁺	Mg ²⁺	Al ³⁺	Oil and grease	Total hardness	Alkalinity	Total coliform	Fecal coliform
1	N1	High	0.03	0.08	0.02	1.38	18	46.2	6.54	84.61	<0.3	<0.01	364.4	49	1400	240
2		Low	0.04	0.12	0.05	0.69	14	35.5	6.98	70.0	<0.3	<0.01	305.4	49	1700	320
3	N2	High	0.25	1.11	1.55	1.09	18	46.7	15.89	123.07	<0.3	<0.01	546	61	1300	130
4		Low	0.32	1.23	1.6	1.15	16	37.3	6.81	76.81	<0.3	<0.01	333	42	1800	270
5	N3	High	0.03	0.08	0.35	1.79	30	48.4	7.48	99.17	<0.3	<0.01	426.7	53	2400	230
6		Low	0.03	0.11	0.44	1.77	16	45.9	7.73	88.46	<0.3	<0.01	383.2	57	3300	790
7	N4	High	0.03	0.46	0.9	1.12	16	39.8	8.41	88.46	<0.3	<0.01	384.9	49	910	140
8		Low	0.05	0.63	0.97	1.2	14	33.4	7.12	67.08	<0.3	<0.01	293.7	57	2100	550
9	N5	High	0.21	2.52	0.48	2.2	14	46.8	10.28	88.46	<0.3	<0.01	389.6	39	400	220
10		Low	0.18	2.68	0.57	1.78	16	42.1	7.48	84.58	<0.3	<0.01	366.6	41	1300	370
11	N6	High	0.11	0.47	1.3	0.54	16	41.9	14.02	84.61	<0.3	<0.01	383.1	49	920	220
12		Low	0.15	0.72	1.42	0.47	14	36.7	7.44	73.89	<0.3	<0.01	322.6	53	1900	360

No.	Label of water samples	Tide	mg/L											Total hardness	Alkalinity	Total coliform	Fecal coliform
			P-PO ₄ ³⁻	N-NH ₄ ⁺	N-NO ₂ ⁻	N-NO ₃ ⁻	Cl ⁻	SO ₄ ²⁻	Ca ²⁺	Mg ²⁺	Al ³⁺	Oil and grease					
13	N7	High	<0.01	0.5	0.9	1.45	14	37.2	5.61	73.07	<0.3	<0.01	314.6	29	980	150	
14		Low	<0.01	0.65	1.05	1.4	14	31.9	6.57	65.14	<0.3	<0.01	284.4	39	1500	280	
15	N8	High	0.39	2.66	1.15	1.64	16	52.9	6.54	91.39	<0.3	<0.01	392.3	37	1100	170	
16		Low	0.27	2.81	1.21	1.53	16	37.7	7.63	78.75	<0.3	<0.01	343	45	1300	280	
17	N9	High	0.19	1.56	1.02	1.23	16	43.7	8.41	85.72	<0.3	<0.01	373.7	39	2200	920	
18		Low	0.22	1.79	1.31	1.12	14	38.0	7.59	77.78	<0.3	<0.01	338.9	29	3200	1300	
19	N10	High	<0.01	1.76	2.00	0.58	26	55.5	11.22	103.84	<0.3	<0.01	455.2	29	1700	1100	
20		Low	<0.01	1.45	2.09	0.95	24	48.6	9.16	103.84	<0.3	<0.01	450.1	29	3000	1300	
21	N11	High	0.16	0.71	1.54	0.94	16	28.7	6.49	59.31	<0.3	<0.01	260.2	37	400	230	
22		Low	0.2	0.88	1.72	1.14	14	25.1	6.53	50.56	<0.3	<0.01	224.3	29	1100	720	
23	N12	High	0.11	0.38	0.05	1.02	14	15.7	4.87	33.06	<0.3	<0.01	148.2	13	450	230	
24		Low	0.19	0.53	0.08	1.14	14	22.3	5.42	44.72	<0.3	<0.01	197.5	39	1200	370	
25	N13	High	<0.01	0.42	1.08	1.07	30	48.1	8.19	96.73	<0.3	<0.01	418.4	49	1000	330	
26		Low	<0.01	0.6	1.23	1.14	16	41.1	7.95	84.61	<0.3	<0.01	367.9	53	1300	780	
27	N14	High	<0.01	0.82	1.41	1.12	24	52.8	9.37	98.19	<0.3	<0.01	427.4	25	3900	540	
28		Low	<0.01	0.73	1.69	1.02	24	47.3	8.71	95.11	<0.3	<0.01	413	29	4700	1100	
29	N15	High	<0.01	0.56	1.3	0.94	30	62.5	10.61	92.3	<0.3	<0.01	406.2	37	3300	1800	
30		Low	<0.01	0.69	1.54	0.85	14	48.6	8.56	92.46	<0.3	<0.01	401.8	57	4700	1300	
31	N16	High	<0.01	0.91	1.85	1.03	38	76.9	11.22	123.07	<0.3	<0.01	534.3	39	4900	1700	
32		Low	<0.01	1.17	1.92	1.08	24	54.3	9.63	103.84	<0.3	<0.01	451.2	53	5200	1900	
33	N17	High	<0.01	0.84	0.96	1.16	32	69.1	9.63	114.5	<0.3	<0.01	495.1	49	2800	1100	
34		Low	<0.01	1.02	1.27	0.98	30	62.8	10.45	103.84	<0.3	<0.01	453.3	49	3400	1500	
35	N18	High	<0.01	0.71	1.7	1.34	32	91.3	11.22	126.92	<0.3	<0.01	550.2	39	4900	2400	
36		Low	<0.01	0.89	1.86	1.32	30	65.3	9.47	115.7	<0.3	<0.01	499.6	53	6800	3200	
37	N19	High	<0.01	0.53	1.1	1.48	24	76.8	9.35	111.53	<0.3	<0.01	482.2	49	890	130	
38		Low	<0.01	0.94	1.32	1.23	30	60.2	9.82	113.8	<0.3	<0.01	492.7	53	1700	250	

No.	Label of water samples	Tide	P-PO ₄ ³⁻	N-NH ₄ ⁺	N-NO ₂ ⁻	N-NO ₃ ⁻	Cl ⁻	SO ₄ ²⁻	Ca ²⁺	Mg ²⁺	Al ³⁺	Oil and grease	Total hardness	Alkalinity	Total coliform	Fecal coliform
			mg/L										mg CaCO ₃ /L	MPN/100mL		
39	N20	High	<0.01	0.31	0.65	1.5	24	47.7	9.35	107.69	<0.3	<0.01	466.4	49	1800	320
40		Low	<0.01	0.67	0.94	1.05	24	50.7	8.97	99.17	<0.3	<0.01	430.4	53	2700	840

Manager of lab.

th

Dong Thi An Thuy

Manager of CESTE

nda

Vu Nguyen Hoang Giang

By order Director of SIWRR



Phuong Xuan Minh





SOUTHERN INSTITUTE OF WATER RESOURCES RESEARCH
CENTER FOR ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY

Address: 658 Vo Van Kiet Street, District 5, Ho Chi Minh City, Vietnam
Tel: 84 28 39233700 – 84 28 39244286 Fax: 84 28 39235028
Email: ceste.siwrr@gmail.com

No: DT4/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject “Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)”

Type of sample: Groundwater

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 20/08/2017

No.	Label of Groundwater samples	pH	EC	Turbidity	TSS	TDS	P-PO ₄ ³⁻	TN	Cl	SO ₄ ²⁻	Total iron
			μS/cm	NTU				mg/l			
1	G1	7.88	872	1.03	<2	607.5	<0.01	1.43	99.8	73.3	0.313
2	G2	7.63	804	1.18	<2	532.6	<0.01	1.27	95.7	62.7	0.317
3	G3	7.74	771	0.91	<2	514.6	<0.01	1.22	90.0	53.1	0.165
4	G4	7.81	812	1.24	<2	548.3	<0.01	1.33	103.5	56.9	0.283
5	G5	7.54	798	1.49	<2	530	<0.01	1.37	108.0	46.5	0.275

Manager of lab.

Dong Thi An Thuy

Manager of CESTE

Vu Nguyen Hoang Giang



Dương Xuân Minh



SOUTHERN INSTITUTE OF WATER RESOURCES RESEARCH
CENTER FOR ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY

Address: 658 Vo Van Kiet Street, District 5, Ho Chi Minh City, Vietnam
Tel: 84 28 39233700 – 84 28 39244286 Fax: 84 28 39235028
Email: ceste.siwrr@gmail.com

No: DT5/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject “Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)”

Type of sample: Groundwater

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 20/08/2017

No.	Label of Groundwater samples	Ca ²⁺	Mg ²⁺	Total hardness	Alkalinity	As	Cd	Pb	Mn	Cr	Zn	Total coliform
		mg/L	mg/L	mg CaCO ₃ /L	mg/L							
1	G1	8.41	99.3	429.55	247	<0.001	<0.005	<0.01	0.07	<0.01	<0.03	6.1
2	G2	9.42	98.54	428.92	213	<0.001	<0.005	<0.01	0.06	<0.01	<0.03	0
3	G3	8.41	96.15	416.57	209	<0.001	<0.005	<0.01	0.03	<0.01	<0.03	1.8
4	G4	11.36	97.64	430.05	239	<0.001	<0.005	<0.01	0.04	<0.01	<0.03	0
5	G5	12.15	96.15	425.9	205	<0.001	<0.005	<0.01	0.06	<0.01	<0.03	0

Manager of lab.

Dong Thi An Thuy

Manager of CESTE

Vu Nguyen Hoang Giang



Đông Xuân Minh



CENTER FOR ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY

Address: 65B Võ Văn Kiệt Street, District 5, Ho Chi Minh City, Vietnam

MIỀN 8448 39233700 – 84 28 39244286 Fax: 84 28 39235028

Email: ceste.siwrr@gmail.com

No: DT6/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject “Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)”

Type of sample: Soil

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 24/08/2017

No.	Label of soil samples	pH _{h2o}	pH _{KCl}	EC	Salinity	Water content	Humus	TN	TP	K ₂ O	Cl	mg/100g		Acidity	Mn	Cd	mg/kg			
				(1:5) μS/cm	(1:5) ‰							Total iron	Al ³⁺				Pb	Zn	As	
1	D1	T1	5.64	4.79	148.6	0.0	24.6	1.49	0.18	0.02	1.53	3.25	102.57	0.12	95.5	0.11	31.0	116.2	0.32	
2		T2	5.08	4.15	232	0.0	27.6	1.41	0.16	0.017	1.54	6.24	69.68	0.37	63.7	0.09	35.3	126.2	0.25	
3		T3	5.05	4.29	274.4	0.0	23.2	1.49	0.15	0.019	1.62	6.48	68.12	<0.5	0.33	64.3	0.08	38.4	127	0.22
4	D2	T1	3.44	3.14	1354	0.6	32.6	2.49	0.19	0.016	2.12	37.46	82.03	49.76	6.74	75.3	0.09	30.1	118.2	0.21
5		T2	3.8	3.35	628	0.3	22.9	1.41	0.15	0.017	1.95	17.5	15.11	26.94	3.29	13.9	0.16	32.5	116.5	0.42
6		T3	3.44	3.03	425	0.2	24.3	1.06	0.14	0.015	2.07	11.2	30.29	41.53	5.12	27.9	0.08	33.0	112.6	0.33
7	D3	T1	3.64	3.12	1365.4	0.6	26.3	2.16	0.17	0.021	1.88	35.5	79.84	30.04	2.66	73.8	0.13	35.5	139.3	0.36
8		T2	3.52	3.14	436.5	0.2	24.5	1.11	0.14	0.01	1.65	7.9	41.5	35.46	4.29	38.5	0.1	34.7	132.8	0.22
9		T3	3.48	3.11	463.4	0.2	26.3	1.03	0.14	0.018	1.46	5.2	33.6	40.12	1.98	31.3	0.09	32.6	135.1	0.24
10	D4	T1	3.55	3.25	1105.4	0.5	31.5	1.96	0.17	0.019	2.00	26.94	101.1	36.21	2.24	93.8	0.11	33.6	125.3	0.43
11		T2	3.61	3.16	440.6	0.2	22.5	1.32	0.15	0.016	2.14	5.2	26.7	30.45	2.12	24.7	0.13	35.1	136.6	0.39
12		T3	3.46	3.05	457.3	0.2	25.4	1.25	0.14	0.016	1.32	5.2	31.1	40.26	1.89	28.8	0.07	33.8	123.1	0.5

No.	Label of soil samples	pH _{H2O}	pH _{KCl}	EC	Salinity	Water content	Humus	TN	TP	K ₂ O	Cl ⁻	Total iron	Al ³⁺	Acidity	Mn	Cd	Pb	Zn	As	
				(1:5) μS/cm	(1:5) ‰							mg/100g	Al ³⁺							meq/100g
37	D13	T1	5.03	4.45	333.7	0.1	28.4	3.96	0.19	0.019	2.26	4.16	301.3	<0.5	0.31	281.6	0.11	30.7	125.1	0.55
38		T2	4.77	4.19	401.2	0.1	26.4	4.02	0.25	0.016	1.75	4.87	263.6	23.64	1.55	241.1	0.13	33.3	134.5	0.26
39		T3	4.97	4.51	544.3	0.2	34.5	3.84	0.26	0.011	1.65	7.28	264.8	8.79	1.15	242.8	0.09	34.0	126.1	0.32
40	D14	T1	4.84	4.26	316.3	0.1	33.6	4.44	0.24	0.023	2.17	4.52	268.4	14.26	1.73	248.5	0.1	32.4	124.2	0.31
41		T2	5.06	4.48	355.6	0.1	35.4	4.25	0.24	0.012	1.94	4.16	254.7	<0.5	0.16	245.7	0.08	31.2	124	0.36
42		T3	4.97	4.51	403.2	0.1	35.1	3.69	0.23	0.014	2.12	4.16	236.3	9.25	1.21	220.2	0.15	33.3	121.9	0.35
43	D15	T1	4.7	4.12	317	0.1	28.7	3.52	0.26	0.019	1.93	7.8	246.35	12.62	0.92	230.5	0.1	34.6	125.2	0.33
44		T2	4.77	4.19	344	0.1	32.9	4.75	0.26	0.011	1.7	4.16	217.62	14.12	1.25	203.1	0.11	36.1	121.1	0.29
45		T3	5.05	4.59	549	0.2	41.9	4.33	0.23	0.012	1.51	14.56	226.4	<0.5	0.32	209.5	0.11	34.1	135.3	0.22

Manager of lab.

[Signature]

Dong Thi An Thuy

Manager of CESTE

[Signature]

Vu Nguyen Hoang Giang

By order Director of SIWRR



Đương Xuân Minh





**SOUTHERN INSTITUTE OF WATER RESOURCES RESEARCH
CENTER FOR ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY**
No 650 Vo Van Kiet Street, District 5, Ho Chi Minh City, Vietnam
Tel: 84 8 39233700 – 84 8 39244286 Fax: 84 8 39235028
Email: ceste.sivwr@gmail.com

No: DT7/Ceste/2017
/SIWRR.BQ.15.04

TEST RESULT

The subproject “Improving the ability of flood drainage and developing stable livelihoods, climate change adaptation in the Plain of Reed (the northern districts of Dong Thap province)”

Type of sample: Sediment

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 24/08/2017

No.	Label of Sediment samples	pH _{H2O}	pH _{KCl}	EC	Salinity	water content	%					Cl ⁻	mg/100g			Acidity	mg/kg				
				(1:5) $\mu S/cm$	(1:5) ‰		Humus	TN	TP	K ₂ O	Total iron		SO ₄ ²⁻	Al ³⁺	Mn		Cd	Pb	Zn	As	
1	TT1	5.66	5.26	439	0.1	44.2	4.37	0.29	0.075	2.15	3.12	327.3	14.2	0.37	0.33	304.7	0.14	32.1	117.9	0.3	
2	TT2	5.34	4.97	345	0.1	47.1	2.99	0.26	0.041	1.56	4.16	298.4	23.8	0.75	0.42	272.6	0.11	32.6	127.9	0.26	
3	TT3	5.37	4.98	470	0.2	43.1	3.56	0.31	0.057	1.45	4.63	189.8	28.5	0.62	0.75	179.1	0.1	30.0	128.7	0.37	
4	TT4	5.5	5.09	467	0.2	45.6	3.26	0.27	0.061	1.61	4.16	198.7	26.4	0.54	0.28	182.3	0.12	32.2	119.9	0.19	
5	TT5	5.46	5.02	473	0.2	44.2	3.14	0.29	0.054	1.72	6.15	188.4	24.8	0.49	0.35	173.3	0.14	32.4	118.2	0.11	
6	TT6	5.47	4.93	556	0.2	46.1	3.97	0.29	0.068	1.38	5.2	220.3	145.6	0.61	0.38	203	0.08	32.6	114.3	0.14	
7	TT7	5.52	4.95	601	0.2	48.6	4.01	0.32	0.062	1.68	5.2	214.3	256.4	0.49	0.47	198	0.12	34.1	141	0.16	
8	TT8	5.43	5.07	645	0.2	50.4	4.75	0.34	0.071	1.43	9.42	222	316.8	0.37	0.37	205.8	0.11	30.2	134.5	0.37	
9	TT9	5.41	4.98	574	0.2	50.1	4.25	0.32	0.067	1.45	5.2	223.4	314.1	0.55	0.42	207.9	0.12	32.0	136.8	0.33	
10	TT10	5.26	4.72	624	0.2	44.8	4.45	0.33	0.068	1.8	5.2	236.4	304.1	0.63	0.6	219.3	0.16	31.2	127	0.21	

No.	Label of Sediment samples	pH _{H2O}	pH _{KCl}	EC (1:5)	Mặn (1:5)	water content	Humus	TN	TP	K ₂ O	Cl ⁻	Total iron	SO ₄ ²⁻	Al ³⁺	Acidity	Mn	Cd	Pb	Zn	As	
				μS/cm	‰		%				mg/100g					meq/100g					
11	TT11	5.23	4.72	598	0.2	43.5	4.26	0.32	0.067	1.7	5.68	224.1	215.6	0.56	0.51	207.5	0.14	32.7	138.3	0.2	
12	TT12	5.19	4.7	614	0.2	44.8	4.14	0.29	0.071	1.62	7.28	241.5	206.4	0.47	0.29	223.6	0.1	32.4	124.8	0.18	
13	TT13	5.21	4.68	598	0.2	41.6	4.67	0.32	0.074	2.21	5.2	222.4	212.3	0.51	0.53	207.9	0.12	29.3	122.8	0.16	
14	TT14	4.94	4.55	583	0.2	42.3	4.91	0.33	0.075	1.7	5.84	235.3	214.9	0.68	0.62	215.2	0.11	31.9	116.9	0.34	
15	TT15	5.71	5.32	396	0.1	46.9	3.3	0.28	0.059	1.6	5.2	412.8	90.8	0.37	0.33	378.5	0.14	32.6	115.2	0.21	

Manager of lab.

[Signature]

Dong Thi An Thuy

Manager of CESTE

[Signature]

Vu Nguyen Hoang Giang



By order Director of SIWRR

[Signature]

Dương Xuân Minh



Email: ceste.sivrr@gmail.com

TEST RESULT

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No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
14	<i>Surirella ovalis</i>		*							*										*	*
15	<i>Synedra acus</i>	*														*					
16	<i>Synedra fulgens</i>		*																	*	
17	<i>Synedra ulna</i>					*	*								*						
II CYANOPHYTA																					
1	<i>Anabaena sp.</i>			*																	
2	<i>Coelosphaerium pusillum</i>				*													*	*		
3	<i>Lyngbya circumcreta</i>	*						*	*	*	*						*				*
4	<i>Merismopedia minima</i>																				*
5	<i>Merismopedia elegans</i>		*															*	*	*	*
6	<i>Merismopedia trolleri</i>	*		*	*			*				*	*	*	*	*	*	*	*	*	*
7	<i>Microcystis aeruginosa</i>	*		*								*	*	*	*	*	*		*	*	*
8	<i>Oscillatoria acuminata</i>	*	*		*			*	*	*	*					*	*	*	*		
9	<i>Oscillatoria irrigua</i>		*	*		*	*	*	*			*	*		*	*	*	*	*		
10	<i>Oscillatoria limosa</i>	*																		*	*
11	<i>Peridinium conicum</i>	*	*	*	*												*				
12	<i>Gloeocapsa sp.</i>		*																	*	*
13	<i>Spirulina sp.</i>							*	*	*	*								*		
IV EUGLENOPHYTA																					
1	<i>Euglena phacus acuminatus</i>	*	*	*				*		*	*	*	*							*	*
2	<i>Euglena phacus orbicularis</i> var. <i>caudatus</i>																			*	*
3	<i>Euglena aculeatus</i>						*						*					*		*	*
4	<i>Phacus hispidulus</i>															*					*
5	<i>Phacus sp.</i>																				
6	<i>Trachelomonas cylindracea</i>																			*	*
7	<i>Trachelomonas planctonica</i>																				
8	<i>Trachelomonas sp.</i>	*	*	*	*														*	*	*
V CHLOROPHYTA																					
1	<i>Actinastrum acuminatus</i>			*	*			*	*									*	*	*	*

No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
2	<i>Actinastrium gracillimum</i>	*																			
3	<i>Ankistrodesmus angustus</i>																				
4	<i>Ankistrodesmus falcatus</i>		*	*	*	*		*						*	*			*	*		
5	<i>Ankistrodesmus convolutus</i>				*													*			
6	<i>Ankistrodesmus dimorphus</i>						*														
7	<i>Ankistrodesmus obtusus</i>																				
8	<i>Ankistrodesmus longissimus</i>											*								*	*
9	<i>Closterium koernickei</i>	*																			
10	<i>Coelastrum sphaericum</i>	*	*																		
11	<i>Cosmarium obsoletum</i>	*																			
12	<i>Cosmarium polygonum</i>																	*	*		
13	<i>Cosmarium ellipsoideum</i>				*	*								*						*	
14	<i>Chlamydomonas reinhardtii</i>																				
15	<i>Chodatella sp.</i>		*							*	*			*							
16	<i>Chlorosphaera angulosa</i>																				
17	<i>Chlorella ellipsoidea</i>																*	*	*	*	*
18	<i>Chlorella vulgaris</i>		*		*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*
19	<i>Chlorococcum humicola</i>	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*
20	<i>Crucigenia fenestrata</i>																				
21	<i>Crucigenia quadrata</i>									*	*		*								
22	<i>Crucigenia tetrapedia</i>	*	*	*	*	*	*					*	*					*	*		
23	<i>Dictyosphaerium simplex</i>				*																
24	<i>Dimorphococcus SP.</i>											*								*	*
25	<i>Dispora crucigenioides</i>															*		*	*		
26	<i>Gonium pectorale</i>																	*	*		
27	<i>Gonium sociale</i>	*		*		*		*		*											
28	<i>Golenkinia paucispina</i>																				
29	<i>Golenkinia radiata</i>																	*	*	*	*
30	<i>Gloeocapsa minima</i>					*				*	*			*	*	*	*	*	*	*	*
31	<i>Oocystis borei</i>							*		*	*										*

No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
32	<i>Oocystis elliptica</i>	*															*		*		
33	<i>Pandorina morum</i>											*	*								
34	<i>Pediastrum duplex</i>	*	*	*	*							*	*	*						*	
35	<i>Pediastrum duplex Meyen</i>																		*	*	
36	<i>Pediastrum tetras</i> var. <i>tetraodon</i>											*	*	*	*					*	
37	<i>Pediastrum</i> sp.		*	*	*															*	*
38	<i>Nephrocyclium obesum</i>																			*	*
39	<i>Nephrocyclium limneticum</i>																				
40	<i>Kirchneriella contorta</i>		*					*	*							*	*				
41	<i>Kirchneriella lunaris</i>			*	*					*	*	*	*	*	*	*	*		*	*	
42	<i>Scenedesmus arcuatus</i>						*		*	*	*		*	*	*	*	*		*	*	
43	<i>Scenedesmus acuminatus</i> <i>Chodat</i>	*		*	*					*	*	*	*	*	*				*	*	
44	<i>Scenedesmus bicaudatus</i>					*		*						*			*	*		*	
45	<i>Scenedesmus biungatus</i>	*		*	*															*	*
46	<i>Scenedesmus curvatus</i>		*	*	*	*	*			*	*		*	*	*					*	*
47	<i>Scenedesmus denticulatus</i>		*																		
48	<i>Scenedesmus dimorphus</i>	*																			*
49	<i>Scenedesmus ellipsoides</i>							*	*	*	*		*		*	*	*		*	*	
50	<i>Scenedesmus obliquus</i>	*	*	*	*			*	*												
51	<i>Scenedesmus protuberans</i>		*	*	*	*	*			*	*		*		*		*	*	*	*	*
52	<i>Scenedesmus quadricauda</i>	*		*	*	*	*			*	*	*	*		*		*	*	*	*	*
53	<i>Schroederia setigera</i>																			*	
54	<i>Schroederia spiralis</i>	*	*	*	*	*	*			*	*		*	*	*	*	*	*	*	*	*
55	<i>Spaerocystis polycoeca</i>		*																	*	*
56	<i>Staurastrum</i> sp.					*	*									*	*			*	*
57	<i>Tetraedron lunula</i>																				
58	<i>Tetrachlorella alternans</i>	*	*	*	*	*	*							*	*						
59	<i>Tetrastrum heterocanthum</i>														*	*					

No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
60	<i>Westella boryoides</i>											*	*	*	*						
	Quantity (speices/site)	29	30	24	23	15	15	12	14	11	12	18	17	16	15	15	17	23	24	30	28
	Quantity (speices/l)	15,2	14,6	20,1	10,3	9,5	11,2	14,4	17,2	18,6	12,3	15,6	16,4	13,2	11,7	15,4	16,1	20,4	22,8	31,7	26,5

Note: "*" Location which are detected

Manager of lab.



Dong Thi An Thuy

Manager of CESTE



Vu Nguyen Hoang Giang



By order Director of SIWRR

Dương Xuân Minh





Address: 658 Yô Van Kiet Street, District 5, Ho Chi Minh City, Vietnam
Tel: 84 28 39233700 – 84 28 39244286 Fax: 84 28 39235028

Fax: 84 28 39235028
com

TEST RESULT

TEST RESULT

No.	Name of group	TS11		TS12		TS13		TS14		TS15		TS16		TS17		TS18		TS19		TS20	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	BACILLARIOPHYTA																				
1	<i>Cyclotella comta</i>		*				*		*		*	*				*	*	*	*		
2	<i>Cyclotella stelligera</i>	*			*	*		*		*	*	*		*	*	*	*	*	*	*	*
3	<i>Cymbella cuspidata</i>								*			*	*			*		*	*	*	*
4	<i>Frustulia rhomboides</i>																	*		*	*
5	<i>Naviculales closterium</i>		*		*	*	*		*								*		*	*	*
6	<i>Navicula sp.</i>	*		*	*	*	*	*	*	*	*		*	*	*	*				*	*
7	<i>Nitzschia acuta</i>																				
8	<i>Nitzschia lanceolata</i>							*		*	*				*	*	*	*	*		
9	<i>Nitzschia sp.</i>					*	*		*												
10	<i>Melosira granulata</i>	*	*	*	*	*			*		*	*		*	*	*	*	*	*	*	*
11	<i>Melosira moniliformis</i>															*					
12	<i>Melosira varians</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13	<i>Rhizosolenia longiseta</i>														*						

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No.	Name of group	TS11		TS12		TS13		TS14		TS15		TS16		TS17		TS18		TS19		TS20	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
2	<i>Actinastrium gracillimum</i>	*																		*	
3	<i>Ankistrodesmus angustus</i>	*				*															
4	<i>Ankistrodesmus falcatus</i>									*		*						*			
5	<i>Ankistrodesmus convolutus</i>											*	*						*		
6	<i>Ankistrodesmus dimorphus</i>												*								
7	<i>Ankistrodesmus obtusus</i>									*											
8	<i>Ankistrodesmus longissimus</i>															*				*	*
9	<i>Closterium koernickei</i>		*																		
10	<i>Coelastrum sphaericum</i>		*											*							
11	<i>Cosmarium obsoletum</i>																				
12	<i>Cosmarium polygonum</i>													*			*				
13	<i>Cosmarium ellipsoideum</i>	*				*		*		*		*		*	*	*		*	*		
14	<i>Chlamydomonas reinhardtii</i>							*	*												
15	<i>Chodatella sp.</i>					*			*												
16	<i>Chlorosphaera angulosa</i>							*													
17	<i>Chlorella ellipsoidea</i>			*	*							*	*	*	*	*				*	*
18	<i>Chlorella vulgaris</i>	*			*	*	*		*			*	*			*	*				*
19	<i>Chlorococcum humicola</i>	*	*		*					*	*	*	*			*	*				
20	<i>Crucigenia fenestrata</i>																				
21	<i>Crucigenia quadrata</i>									*											
22	<i>Crucigenia tetrapetala</i>					*	*		*					*	*	*	*	*	*	*	*
23	<i>Dictyosphaerium simplex</i>											*	*			*	*	*	*	*	*
24	<i>Dimorphococcus SP.</i>	*	*															*	*	*	*
25	<i>Dispora crucigenioides</i>			*												*	*				*
26	<i>Gonium pectorale</i>						*					*	*					*	*		*
27	<i>Gonium sociale</i>		*			*				*				*	*	*	*	*	*		*
28	<i>Golenkinia paucispina</i>	*												*	*	*	*	*	*		*
29	<i>Golenkinia radiata</i>											*	*			*	*	*	*		*
30	<i>Gloeocapsa minima</i>															*	*	*	*		*
31	<i>Oocystis borei</i>					*	*		*							*	*				

No.	Name of group	TS11		TS12		TS13		TS14		TS15		TS16		TS17		TS18		TS19		TS20	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
32	<i>Oocystis elliptica</i>	*	*	*	*	*				*			*					*	*		
33	<i>Pandorina morum</i>				*										*					*	
34	<i>Pediastrum duplex</i>		*												*	*	*	*			*
35	<i>Pediastrum duplex Meyen</i>	*		*														*	*		*
36	<i>Pediastrum tetras</i> var. <i>tetraodon</i>				*	*	*	*	*	*					*	*	*				
37	<i>Pediastrum</i> sp.								*	*	*				*	*	*				
38	<i>Nephrocytium obesum</i>																	*			
39	<i>Nephrocytium limneticum</i>						*														
40	<i>Kirchneriella contorta</i>								*		*										
41	<i>Kirchneriella lunaris</i>														*	*					
42	<i>Scenedesmus arcuatus</i>	*			*				*		*			*	*				*		
43	<i>Scenedesmus acuminatus</i> <i>Chodat</i>	*	*		*									*					*	*	*
44	<i>Scenedesmus bicaudatus</i>			*		*	*	*	*	*	*	*	*					*	*		
45	<i>Scenedesmus bijugatus</i>			*			*	*										*	*		
46	<i>Scenedesmus curvatus</i>																				
47	<i>Scenedesmus denticulatus</i>	*		*	*		*														
48	<i>Scenedesmus dimorphus</i>																	*			
49	<i>Scenedesmus ellipsoides</i>					*											*				
50	<i>Scenedesmus obliquus</i>	*	*	*		*						*	*	*	*	*	*	*	*		
51	<i>Scenedesmus protuberans</i>														*		*	*	*		
52	<i>Scenedesmus quadricauda</i>				*	*	*	*				*						*	*	*	*
53	<i>Schroederia setigera</i>					*						*				*					
54	<i>Schroederia spiralis</i>		*		*				*								*				
55	<i>Spaerocystis polycocca</i>	*										*			*						
56	<i>Staurastrum</i> sp.						*		*	*			*				*	*	*	*	*
57	<i>Tetraedron lunula</i>	*	*		*										*					*	*
58	<i>Tetrachlorella alternans</i>		*		*																
59	<i>Tetrastrum heterocanthum</i>									*				*							

No.	Name of group	TS11		TS12		TS13		TS14		TS15		TS16		TS17		TS18		TS19		TS20	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
60	<i>Westella botryoides</i>																	*		*	
	Quantity (speices/site)	26	27	18	17	24	24	16	17	14	15	18	16	22	25	23	23	27	25	19	20
	Quantity (speices/l)	17,0	16,4	21,5	14,5	10,6	12,5	16,1	19,3	20,8	18,8	17,5	18,4	14,8	13,1	17,2	18	20,8	25,5	25,5	19,7

Note: "*" Location which are detected

Manager of lab.

[Signature]

Dong Thi An Thuy

Manager of CESTE

[Signature]

Vu Nguyen Hoang Giang



By order Director of SIWRR

[Signature]

Trương Xuân Minh





Van Kiet Stresst, District 5, Ho Chi Minh City, Vietnam
2233700 – 84 28 39244286 Fax: 84 28 39235028

Fax: 84 28 39235028

TEST RESULT

TEST RESULT

TEST RESULT

TEST RESULT

TEST RESULT

TEST RESULT

[illegible]

No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
16	<i>Limnithona sinensis</i>	*		*		*		*		*		*		*		*		*		*	
17	<i>Limnorea genuine</i>				*	*		*		*		*		*		*		*		*	
18	<i>Mesocyclops leuckarti</i>							*		*											
19	<i>Mongolodiptomus formosanus</i>							*	*											*	
20	<i>Neodiptomus botulifer</i>	*	*					*		*		*		*		*		*		*	
21	<i>Neodiptomus handeli</i>		*					*		*		*		*		*		*		*	
22	<i>Neodiptomus visnu</i>							*		*		*		*		*		*		*	
23	<i>Heliodiptomus serratus</i>									*		*		*		*		*		*	
24	<i>Paracalanus aculeatus</i>													*						*	
25	<i>Paracyclops serrulatus</i>		*	*								*				*				*	
26	<i>Paracalanus parvus</i>			*	*															*	
27	<i>Phyllodiptomus tunguidus</i>	*										*				*				*	
28	<i>Thermocyclops hyalinus</i>		*																	*	
III DECAPODA																					
1	<i>Lucifer penicillifer</i>	*	*					*	*	*		*		*		*		*		*	
2	<i>Siriella clausi</i>									*						*				*	
IV CHAETOGNATA																					
1	<i>Sagitta bedoti f. minor</i>	*		*	*			*		*	*	*	*	*	*	*	*	*	*	*	*
2	<i>Sagitta bedoti</i>		*							*	*	*	*	*	*	*	*	*	*	*	*
3	<i>Sagitta delicata</i>	*	*	*						*	*	*	*	*	*	*	*	*	*	*	*
4	<i>Sagitta serratodentata</i>									*	*	*	*	*	*	*	*	*	*	*	*
Quantity (speices/site)		10	12	9	9	12	11	12	10	11	12	13	14	10	11	12	12	13	14	10	9
Quantity (speices/m ³)		1172	1362	926	1117	535	1176	1027	1138	814	1316	1364	1489	697	589	619	737	1103	2914	734	1352

Note: "*" Location which are detected

Manager of lab.

Manager of CESTE

Director of SIWRR

Dong Thi An Thuy

Vu Nguyen Hoang Giang

Phuong Xuan Minh





Address: 058 Vo Van Kiet Stresst, District 5, Ho Chi Minh City, Vietnam

Tel: 84 28 39233700 – 84 28 39244286 Fax: 84 28 39235028

Fax: 84 28 39235028

Email: ceste.sivrr@gmail.com

TEST RESULT

TEST RESULT

Type of sample: Zooplankton

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 23/05/2017

[illegible]

No.	Name of group	TS11		TS12		TS13		TS14		TS15		TS16		TS17		TS18		TS19		TS20	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
16	<i>Limnoithona sinensis</i>		*								*		*			*	*	*	*		
17	<i>Limnocaeca genuine</i>	*				*		*			*		*			*	*		*	*	
18	<i>Mesocyclops leuckarti</i>																				
19	<i>Mongolodiaptomus formosanus</i>							*										*	*		
20	<i>Neodiaptomus botulifer</i>		*																	*	*
21	<i>Neodiaptomus handeli</i>	*		*		*		*	*	*	*			*	*	*	*	*	*		*
22	<i>Neodiaptomus visnu</i>								*	*					*		*	*	*		
23	<i>Heliodiaptomus serratus</i>												*								
24	<i>Paracalanus aculeatus</i>				*					*							*				*
25	<i>Paracyclops serrulatus</i>				*					*				*	*						*
26	<i>Paracalanus parvus</i>	*						*												*	
27	<i>Phyllodiaptomus tunguidus</i>	*	*			*		*			*										*
28	<i>Thermocyclops hyalinus</i>										*			*	*						*
III DECAPODA																					
1	<i>Lucifer penicillifer</i>	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	<i>Siriella clausi</i>	*				*				*	*								*		
IV CHAETOGNATA																					
1	<i>Sagitta bedoti f. minor</i>	*	*			*		*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	<i>Sagitta bedoti</i>			*		*		*	*	*	*							*	*	*	*
3	<i>Sagitta delicata</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4	<i>Sagitta serradentata</i>			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quantity (speices/site)		11	10	12	11	13	12	14	12	14	15	10	11	11	12	13	13	14	15	11	10
Quantity (speices/m ³)		1468	1032	2742	3306	1584	1482	1040	2368	2410	1894	1076	1448	2062	1744	1832	2182	1264	1504	2174	2842

Note: "*" Location which are detected

Manager of lab.

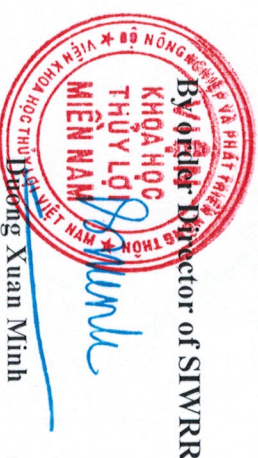
zh

Dong Thi An Thuy

Manager of CESTE

nh

Vu Nguyen Hoang Giang



Đương Xuân Minh



Email: ceste.sivrr@gmail.com

SOUTHERN INSTITUTE OF WATER RESOURCES RESEARCH
CENTER FOR ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY

Fax: 84 28 39235028

Type of sample: Zoobenthic

Time of sampling: 05-07/05/2017

Location of sampling: in Dong Thap province

Result delivered date: 23/05/2017

No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
I	CRUSTACEA																				
1	<i>Macrobrachium mamillodactylus</i>			*		*	*	*		*	*	*	*	*	*	*	*	*	*	*	*
2	<i>Macrobrachium pilimanus</i>		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3	<i>Macrobrachium rosenbergii</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4	<i>Penaeus monodon</i>				*		*						*			*	*	*	*	*	*
5	<i>Fenneropenaeus merguensis</i>					*	*	*		*				*	*	*	*	*	*	*	*
6	<i>Fenneropenaeus indicus</i>	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*	*	*
II	MOLLUSCA																				
1	<i>Alpheus pubescens</i>				*		*		*	*	*			*	*	*	*	*	*	*	*
2	<i>Grandilierella vietnamica</i>	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3	<i>Mesopodopsis slabbei</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4	<i>Synalpheus stimpsoni</i>			*	*					*		*	*	*	*	*	*	*	*	*	*
III	OLIGOCHAETA																				
1	<i>Neanthes caudata</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IV	POLYCHAETA																				
1	<i>Ammotritipane dubia</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	<i>Bispira polymorpha</i>		*	*	*		*		*	*	*		*		*	*	*	*	*	*	*

No.	Name of group	TS1		TS2		TS3		TS4		TS5		TS6		TS7		TS8		TS9		TS10	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
3	<i>Glicinde oligodon</i>	*		*		*		*		*		*		*		*		*		*	
4	<i>Lambrineris sp</i>					*		*				*				*			*		*
5	<i>Dendronereis aestuarina</i>	*		*		*		*		*		*		*		*		*		*	
6	<i>Nephtys californiensis</i>		*					*						*				*		*	
7	<i>Nephtys polybranchia</i>			*				*		*		*		*		*		*		*	
8	<i>Polanilla leptochaeta</i>	*		*		*		*		*		*		*		*		*		*	
9	<i>Prionospio pinnata</i>			*		*		*						*				*		*	
Quantity (speices/site)		9	10	12	13	11	13	12	14	11	12	8	9	11	12	10	9	13	14	9	9
Quantity (speices/m ²)		51	72	87	70	63	91	32	47	24	56	115	91	70	41	47	56	128	78	55	51

Note: "*" Location which are detected

Manager of lab.




Dong Thi An Thuy

Manager of CESTE



Vu Nguyen Hoang Giang



By order Director of SIWRR

 Duong Xuan Minh



TEST RESULT

INSTITUTE OF WATER RESOURCES RESEARCH
ENVIRONMENTAL SCIENCE TECHNOLOGY AND ECOLOGY
8 Vo Van Kiet Street, District 5, Ho Chi Minh City, Vietnam
8 39233700 – 84 28 39244286 Fax: 84 28 39235028

TEST RESULT

Time of sampling: 05-07/05/2017

Result delivered date: 23/05/2017

[illegible]

No.	Name of group	TS11		TS12		TS13		TS14		TS15		TS16		TS17		TS18		TS19		TS20	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
3	<i>Glicinde oligodon</i>		*			*	*			*	*			*	*	*	*	*	*	*	*
4	<i>Lumbrineris sp</i>	*		*		*		*		*	*	*		*	*	*	*	*	*	*	*
5	<i>Dendronereis aestuaria</i>			*		*						*		*	*	*	*	*	*	*	*
6	<i>Nephtys californiensis</i>	*				*				*	*			*	*	*	*	*	*	*	*
7	<i>Nephtys polybranchia</i>	*	*			*	*			*	*	*	*	*	*	*	*	*	*	*	*
8	<i>Polamilla leptochaeta</i>			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9	<i>Prionospio pinnata</i>			*		*	*			*	*			*	*	*	*	*	*	*	*
Quantity (speices/site)		11	9	12	13	14	14	9	10	14	15	8	10	12	15	13	14	9	10	9	10
Quantity (speices/m ²)		91	130	57	85	113	164	58	85	43	101	206	164	126	74	85	101	230	140	98	91

Note: "*" Location which are detected

Manager of lab.



Dong Thi An Thuy

Manager of CESTE



Vu Nguyen Hoang Giang

By  Director of SIWRR




Duong Xuan Minh

APPENDIX 5: PUBLIC CONSULTATION DOCUMENT

APPENDIX 5: RESULTS OF PUBLIC CONSULTATION

Project: Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods (MD-ICRSL)

SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

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MINUTE OF PUBLIC CONSULTATION MEETING AT LOCAL LEVEL ON SAFEGUARD POLICY

Meeting objective: Public consultation on the content of EISA and RAP report of the subproject: Enhancing the capacity of flood release and developing sustainable livelihoods and climate adaptation in the Plain of Reed region (in northern districts of Dong Thap province).

Time: 8h00 on 16/11/2017

Venue: Meeting-hall of the People's Committee of Hong Ngu town

1. Participants

1.1. Representatives of the local community:

- DPC of Hong Ngu town: Mr Dang Van Ne – Vice chairman of Hong Ngu town DPC
- Representatives of CPCs: Tan Hoi, Binh Thanh, An Binh A, An Binh B
- Representatives of Fatherland Front Committees of Tan Hoi, Binh Thanh, An Binh A, An Binh B communes.
- Representatives of other agencies of CPCs: Farmer Union, Women Union, Youth Union, etc.
- The households in the communes affected by the implementation of the subproject.

1.2. Representatives of subproject owner: Mr. Nguyen Quoc Hoi

1.3. Representatives of Consultant:

- Environmental Consultant: Nguyen Kim Duyet.
- Social Consultant: MSc. Vu Nguyen Hoang Giang.

2. The meeting content

- 2.1.Introduction of the meeting objectives.
- 2.2.Introduction about the project, subproject.
- 2.3.Presentation of some livelihood models to be used for the region.
- 2.4.Abstract of identified environmental-social impacts by the implementation of the subproject.
- 2.5.Discussions and opinions contributed by the local community.

3. Comments by local communities

3.1. Mr. Ngo Hoang Vu, An Binh A commune, Hong Ngu town

- Question: How to determine the 2ha area of landfill and the compensation?
- Answer: The implementation is in accordance with the WB's compensation policy, the entire area of land loss will be compensated and supported in accordance with the regulations. At the same time, the affected households receive support for job change and other policies in accordance with the law of Vietnam.

3.2. Mr. Truong Van Thanh, Binh Thanh commune, Hong Ngu Town

- Question: Do livelihood models to be implemented affect the environment?
- Answer: The livelihood models are oriented towards cleaner production such as organic rice production, winter rice production, IPM and biological measure application, etc., therefore they are much less environmental impacts than the current farming practices.

3.3. Mr. Tran Van Da, Tan Hoi commune, Hong Ngu Town

- Question: Is the solidification the dike embankment in Zone 1 - Tan Hoi commune included in the portfolio?
- Answer: Due to the limited budget of this subproject, the solidification of this zone will use funding sources from other subprojects.

4. Conclusions

The content of the meeting was read back to the participants and the participants agreed with the content of the minutes and expected the subproject to be implemented soon.

CONSULTANT

SUBPROJECT OWNER

LOCAL AUTHORITIES

Vu Nguyen Hoang Giang

Nguyen Quoc Hoi

Dang Van Ne

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG DÂN CƯ CHỊU TÁC ĐỘNG TRỰC TIẾP BỞI DỰ ÁN

Mục đích cuộc họp: tham vấn cộng đồng về nội dung báo cáo đánh giá tác động môi trường của Tiêu dự án: “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”.

Thời gian họp: bắt đầu từ 8h00 ngày 16 tháng 11 năm 2017

Địa chỉ nơi họp: UBND Thị xã Hồng Ngự, tỉnh Đồng Tháp

1. Thành phần tham dự:

1.1. Đại diện địa phương:

- Đại diện UBND TX Hồng Ngự: PCT UBND Thị xã Đặng Văn Ne
- Đại diện UBND các xã Tân Hội, Bình Thạnh, An Bình A, An Bình B (TX Hồng Ngự).
- Đại diện UBMTTQ các xã Tân Hội, Bình Thạnh, An Bình A, An Bình B (TX Hồng Ngự).
- Đại diện các cơ quan đoàn thể của các xã: Hội Nông dân, Hội Phụ nữ, Hội người cao tuổi, Ban chỉ huy quân sự, Ban Tài chính, Phòng Địa chính... C&T
- Đại diện của các hộ dân trong vùng dự án, vùng ảnh hưởng của dự án.

1.2. Đại diện Chủ dự án: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp - Sở Nông nghiệp và PTNT Đồng Tháp.

1.3. Đơn vị tư vấn lập báo cáo đánh giá tác động môi trường: Bà Vũ Nguyễn Hoàng Giang và ông Nguyễn Kim Duyệt .

(Danh sách đại biểu tham dự được đính kèm)

2. Nội dung và diễn biến cuộc họp:

2.1. Đại diện UBND Thị xã Hồng Ngự chủ trì cuộc họp thông báo lý do cuộc họp và giới thiệu thành phần tham dự.

2.2. Chủ dự án và đơn vị tư vấn trình bày tóm tắt báo cáo ĐTM của dự án gồm các nội dung của dự án, các tác động tích cực và tiêu cực của dự án đến môi trường và sức

khỏe cộng đồng, các biện pháp giảm thiểu.

- Chủ dự án: Trình bày các thông tin chính về việc đầu tư công trình trong dự án.
- Đơn vị tư vấn: Bà Vũ Nguyễn Hoàng Giang - Viện Khoa học Thủy lợi miền Nam thay mặt chủ đầu tư trình bày báo cáo đánh giá tác động Môi trường của dự án.

2.3. Thảo luận, trao đổi giữa cộng đồng dân cư chịu tác động trực tiếp với chủ dự án, Ủy ban nhân dân cấp xã về các vấn đề mà chủ dự án đã trình bày tại cuộc họp:

- Ý kiến 1: Anh Ngô Hoàng Vũ, xã An Bình A, TX Hồng Ngự.
 - + Xác định khu vực bãi chứa đất 2ha và hình thức đền bù như thế nào?

- Trả lời của đơn vị tư vấn:

Thực hiện chính sách đền bù của WB, toàn bộ diện tích mất đất sẽ được hỗ trợ, đền bù theo đúng quy định. Đồng thời, được hỗ trợ về chuyển đổi nghề nghiệp và các chính sách khác theo đúng quy định của pháp luật.

- Ý kiến 2: anh Trương Văn Thành, xã Bình Thạnh

Phần mô hình sinh kế nếu triển khai hết có ảnh hưởng môi trường hay không?

- Trả lời của đơn vị tư vấn:

Các mô hình sinh kế đều theo hướng sản xuất sạch hơn như sản xuất lúa hữu cơ, lúa mùa, áp dụng các biện pháp IPM, sinh học, nên sẽ giảm bớt ảnh hưởng tới môi trường so với hiện nay.

- Ý kiến 3: Trần Văn Đà, xã Tân Hội

+Cứng hóa đề bao khu 1 xã Tân Hội có nằm trong danh mục đầu tư không?

- Trả lời của đơn vị tư vấn:

Đơn vị tư vấn sẽ chuyển tiếp ý kiến tới chủ đầu tư cũng như đơn vị thiết kế.

3. Kết luận:

Nội dung của cuộc họp đã được đọc lại cho các đại biểu tham gia cùng nghe và các đại biểu tham dự đồng ý với nội dung của biên bản và mong muốn dự án sớm được thực hiện.

ĐẠI DIỆN TƯ VẤN
(Ký, ghi họ tên)



Vũ Nguyễn Hoàng Giang

ĐẠI DIỆN CHỦ DỰ ÁN
(Ký, ghi họ tên)



Nguyễn Quốc Hội

ĐẠI DIỆN UBND
(Ký, ghi họ tên)



Đặng Văn Ne

Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG DÂN CƯ CHỊU TÁC ĐỘNG TRỰC TIẾP BỞI DỰ ÁN

Mục đích cuộc họp: tham vấn cộng đồng về nội dung báo cáo đánh giá tác động môi trường của Tiểu dự án: “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”.

Thời gian họp: bắt đầu từ 14h00 ngày 16 tháng 11 năm 2017

Địa chỉ nơi họp: UBND xã Thường Thới Hậu A, huyện Hồng Ngự, tỉnh Đồng Tháp

1. Thành phần tham dự:

1.1. Đại diện địa phương:

- Đại diện Phòng Nông nghiệp huyện Hồng Ngự
- Đại diện UBND các xã Thường Thới Hậu A, Thường Thới Hậu B, Thường Phước 1 (Huyện Hồng Ngự).
- Đại diện UBMTTQ các xã Thường Thới Hậu A, Thường Thới Hậu B, Thường Phước 1 (Huyện Hồng Ngự).
- Đại diện các cơ quan đoàn thể của các xã: Hội Nông dân, Hội Phụ nữ, Hội người cao tuổi, Ban chỉ huy quân sự, Ban Tài chính, Phòng Địa chính...
- Đại diện của các hộ dân trong vùng dự án, vùng ảnh hưởng của dự án.

1.2. Đại diện Chủ dự án: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp - Sở Nông nghiệp và PTNT Đồng Tháp.

1.3. Đơn vị tư vấn lập báo cáo đánh giá tác động môi trường: Bà Vũ Nguyễn Hoàng Giang và ông Nguyễn Kim Duyệt .

(Danh sách đại biểu tham dự được đính kèm)

2. Nội dung và diễn biến cuộc họp:

2.1. Đại diện UBND xã chủ trì cuộc họp thông báo lý do cuộc họp và giới thiệu thành phần tham dự.

2.2. Chủ dự án và đơn vị tư vấn trình bày tóm tắt báo cáo ĐTM của dự án gồm các nội dung của dự án, các tác động tích cực và tiêu cực của dự án đến môi trường và sức khỏe cộng đồng, các biện pháp giảm thiểu.

- Chủ dự án: Trình bày các thông tin chính về việc đầu tư công trình trong dự án.
- Đơn vị tư vấn: Bà Vũ Nguyễn Hoàng Giang - Viện Khoa học Thủy lợi miền Nam thay mặt chủ đầu tư trình bày báo cáo đánh giá tác động Môi trường của dự án.

2.3. Thảo luận, trao đổi giữa cộng đồng dân cư chịu tác động trực tiếp với chủ dự án, Ủy ban nhân dân cấp xã về các vấn đề mà chủ dự án đã trình bày tại cuộc họp:

- Ý kiến 1: Anh Nhi - Phong, Nông nghiệp H. Phong, Ngại
Thống nhất với dự án. Dự án đã được triển khai
từ năm 2016, dự án sẽ góp phần cải thiện
sinh kế bên vùng cho người dân trong mùa lũ,
cải thiện đời sống, thu nhập của xã đạo.

▪ Trả lời của đơn vị tư vấn:

- Ý kiến 2: A. Huỳnh Thanh Kiên - T. Thới Tân B.
Xin kính chào quý hội
ở cấp Bình Hòa Hạc.

▪ Trả lời của đơn vị tư vấn:

Đơn vị tư vấn sẽ chuyển ý kiến từ chủ đầu
tư & đơn vị lập dự án.

- Ý kiến 5: Ngã Thanh Tuấn - xã Thụy Thới Hải B

Thống nhất với dự án: Tuy nhiên:

- + Nguồn dân chưa được tiếp cận với các mô hình điện.
- + Kinh nghiệm chỉ đầu tư từ chối tập huấn cho X dân.
- + Công trình mạng 9Hui có năm trong khuôn khổ MAK.

▪ Trả lời của đơn vị tư vấn:

- + TDA có kinh phí hỗ trợ tập huấn cho X dân trong các mô hình điện trở nên cũng như các hộ dân trong vùng lân cận.
- + Như 9Hui có năm trong TDA.

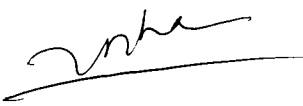
- Ý kiến 6:

▪ Trả lời của đơn vị tư vấn:


3. Kết luận:

Nội dung của cuộc họp đã được đọc lại cho các đại biểu tham gia cùng nghe và các đại biểu tham dự đồng ý với nội dung của biên bản và mong muốn dự án sớm được thực hiện.

ĐẠI DIỆN TƯ VẤN
(Ký, ghi họ tên)


Vũ Nguyễn Hoàng Giang

ĐẠI DIỆN CHỦ DỰ ÁN
(Ký, ghi họ tên)


Nguyễn Quốc Hội

ĐẠI DIỆN UBND
(Ký, ghi họ tên)



Châu Văn Gấm

Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG DÂN CƯ CHỊU TÁC ĐỘNG TRỰC TIẾP BỞI DỰ ÁN

Mục đích cuộc họp: tham vấn cộng đồng về nội dung báo cáo đánh giá tác động môi trường của Tiểu dự án: “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”.

Thời gian họp: bắt đầu từ 8h00 ngày 17 tháng 11 năm 2017

Địa chỉ nơi họp: UBND xã An Hòa, huyện Tam Nông, tỉnh Đồng Tháp

1. Thành phần tham dự:

1.1. Đại diện địa phương:

- Đại diện Phòng Nông nghiệp huyện Tam Nông
- Đại diện UBND các xã An Hòa, An Long, Phú Thành B (Huyện Tam Nông).
- Đại diện UBMTTQ các xã An Hòa, An Long, Phú Thành B (Huyện Tam Nông).
- Đại diện các cơ quan đoàn thể của các xã: Hội Nông dân, Hội Phụ nữ, Hội người cao tuổi, Ban chỉ huy quân sự, Ban Tài chính, Phòng Địa chính...
- Đại diện của các hộ dân trong vùng dự án, vùng ảnh hưởng của dự án.

1.2. Đại diện Chủ dự án: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp - Sở Nông nghiệp và PTNT Đồng Tháp.

1.3. Đơn vị tư vấn lập báo cáo đánh giá tác động môi trường: Bà Vũ Nguyễn Hoàng Giang và ông Nguyễn Kim Duyệt .

(Danh sách đại biểu tham dự được đính kèm)

2. Nội dung và diễn biến cuộc họp:

2.1. Đại diện UBND xã chủ trì cuộc họp thông báo lý do cuộc họp và giới thiệu thành phần tham dự.

2.2. Chủ dự án và đơn vị tư vấn trình bày tóm tắt báo cáo ĐTM của dự án gồm các nội dung của dự án, các tác động tích cực và tiêu cực của dự án đến môi trường và sức khỏe cộng đồng, các biện pháp giảm thiểu.

- Chủ dự án: Trình bày các thông tin chính về việc đầu tư công trình trong dự án.

- Đơn vị tư vấn: Bà Vũ Nguyễn Hoàng Giang - Viện Khoa học Thủy lợi miền Nam thay mặt chủ đầu tư trình bày báo cáo đánh giá tác động Môi trường của dự án.

2.3. Thảo luận, trao đổi giữa cộng đồng dân cư chịu tác động trực tiếp với chủ dự án, Ủy ban nhân dân cấp xã về các vấn đề mà chủ dự án đã trình bày tại cuộc họp:

- Ý kiến 1: Phan Văn Lâm - Xã Phú Thạnh A
 - Thợ nhái các hồ dự án
 - Thay đổi quy hoạch sử dụng đất: làm rõ hơn nội dung này
 - Mô hình có TN có hỗ trợ nguồn vốn có hay không?

▪ Trả lời của đơn vị tư vấn:

- Mr. híp, sử dụng vốn của con gái, thợ nhái, địa điểm và phương thức sản xuất với các nước khác nhau.
- Thay đổi quy hoạch SDA thay đổi không lại, chỉ cần dựa trên nền QHSDA hiện tại.

- Ý kiến 2:

- Xã Phú Ninh
 - + Thợ nhái với đất nông nghiệp dự án
 - + Xã Phú Ninh ở bài 5 có thị trường mua bán không?

▪ Trả lời của đơn vị tư vấn:

- Bà híp, xã chấp nhận ý kiến của cộng đồng dân cư.

- Ý kiến 3: Ngô Quang Đức - Xã Phú Ninh (ở bài 5)

+ Thời nhất có đủ an.
+ Tuy nhiên gần đủ an trên khai cổ dài 3-4 năm
nên đi nghỉ thì công thành, an huy, dài dài, a/h
đến nguồn nước sản xuất của bà con.

▪ Trả lời của đơn vị tư vấn:

Công ty thì công thì cuối giờ theo tỷ lệ
mức công ty đi trả lãi, nên nên t/đ, rồi
x chỉ trợ trợ quan ngân, a/h thì k' đ'đ' k'
đ'đ' sản xuất.

- Ý kiến 4:

▪ Trả lời của đơn vị tư vấn:

3. Kết luận:

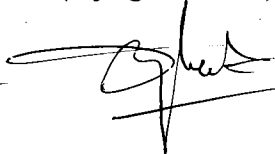
Nội dung của cuộc họp đã được đọc lại cho các đại biểu tham gia cùng nghe và các đại biểu tham dự đồng ý với nội dung của biên bản và mong muốn dự án sớm được thực hiện.

ĐẠI DIỆN TƯ VẤN
(Ký, ghi họ tên)



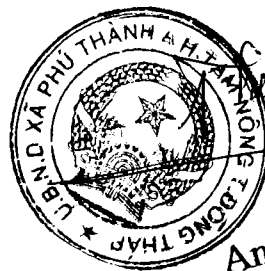
Vũ Nguyễn Hoàng Giang

ĐẠI DIỆN CHỦ DỰ ÁN
(Ký, ghi họ tên)



Nguyễn Quốc Hội

ĐẠI DIỆN UBND
(Ký, ghi họ tên)



An Văn Thiện

Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG DÂN CƯ CHỊU TÁC ĐỘNG TRỰC TIẾP BỞI DỰ ÁN

Mục đích cuộc họp: tham vấn cộng đồng về nội dung báo cáo đánh giá tác động môi trường của Tiểu dự án: “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”.

Thời gian họp: bắt đầu từ 10h00 ngày 17 tháng 11 năm 2017

Địa chỉ nơi họp: UBND xã Phú Thành A, huyện Tam Nông, tỉnh Đồng Tháp

1. Thành phần tham dự:

1.1. Đại diện địa phương:

- Đại diện Phòng Nông nghiệp huyện Tam Nông
- Đại diện UBND các xã Phú Thành A, Phú Thọ, Phú Ninh (Huyện Tam Nông).
- Đại diện UBMTTQ các xã Phú Thành A, Phú Thọ, Phú Ninh (Huyện Tam Nông).
- Đại diện các cơ quan đoàn thể của các xã: Hội Nông dân, Hội Phụ nữ, Hội người cao tuổi, Ban chỉ huy quân sự, Ban Tài chính, Phòng Địa chính...
- Đại diện của các hộ dân trong vùng dự án, vùng ảnh hưởng của dự án.

1.2. Đại diện Chủ dự án: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp - Sở Nông nghiệp và PTNT Đồng Tháp.

1.3. Đơn vị tư vấn lập báo cáo đánh giá tác động môi trường: Bà Vũ Nguyễn Hoàng Giang và ông Nguyễn Kim Duyệt.

(Danh sách đại biểu tham dự được đính kèm)

2. Nội dung và diễn biến cuộc họp:

2.1. Đại diện UBND xã chủ trì cuộc họp thông báo lý do cuộc họp và giới thiệu thành phần tham dự.

2.2. Chủ dự án và đơn vị tư vấn trình bày tóm tắt báo cáo ĐTM của dự án gồm các nội dung của dự án, các tác động tích cực và tiêu cực của dự án đến môi trường và sức khỏe cộng đồng, các biện pháp giảm thiểu.

- Chủ dự án: Trình bày các thông tin chính về việc đầu tư công trình trong dự án.

- Đơn vị tư vấn: Bà Vũ Nguyễn Hoàng Giang - Viện Khoa học Thủy lợi miền Nam thay mặt chủ đầu tư trình bày báo cáo đánh giá tác động Môi trường của dự án.

2.3. Thảo luận, trao đổi giữa cộng đồng dân cư chịu tác động trực tiếp với chủ dự án, Ủy ban nhân dân cấp xã về các vấn đề mà chủ dự án đã trình bày tại cuộc họp:

- Ý kiến 1: A Nguyễn Thuần Nghĩa - PCT UBND huyện Tam Nông.

+ Thống nhất với dự án
 + Dự án tạo việc làm cho người dân địa phương, qua tạo cái thuận giao thông
 kết nối các xã trong khu vực theo các KP của
 tạo được phân phối, phát triển được giao dịch, con em
 đi được, ... Gia tăng thu nhập & dân trong mùa lũ,
 phát triển từ nghề lên khá, khá lên khá giả, ...
 + Huyện rất kỳ vọng vào dự án.

- Trả lời của đơn vị tư vấn:

- Ý kiến 2: Lữ Văn Mạnh - HTX xã Phú Thành B

+ Dự án & dân hiện còn khó khăn nên rất mong mô dự án
 + Đồng ý với các t/ch, cũng như giải pháp giảm thiểu tác
 + Phát động xây dựng các hạng mục tại 4 nam có
 phân bổ, bố trí từ giải ngân ko?

- Trả lời của đơn vị tư vấn:

Dự án sẽ thi công các hạng mục & theo phân
 bổ, đầu tư từng giải ngân.

- Ý kiến 3: HTX An Phú - An Long

Tham nhất với dự án.

Để nghị trong 'thôn quan thi công cái công trợ
tên tiến hập tập huấn cho x dân để họ
nghe khi trên khai mở hức.

▪ Trả lời của đơn vị tư vấn:

Trong ot trên khai dự án ở sẽ có b' trí
tập huấn cho cái họ dân theo C' hoạch
đưa phê duyệt.

- Ý kiến 4:

UBND xã Phú Thạnh B.
Đien tích ở bài đã đặt vào vị thườn xã
phú ' Thạnh B là đất công (5 ha)

▪ Trả lời của đơn vị tư vấn:

Nội dung của cuộc họp đã được đọc lại cho các đại biểu tham gia cùng nghe và các đại biểu tham dự đồng ý với nội dung của biên bản và mong muốn dự án sớm được thực hiện.

WHA

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Nguyễn Bé Ba

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG DÂN CƯ CHỊU TÁC ĐỘNG TRỰC TIẾP BỞI DỰ ÁN

Mục đích cuộc họp: tham vấn cộng đồng về nội dung báo cáo đánh giá tác động môi trường của Tiêu dự án: “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”.

Thời gian họp: bắt đầu từ 14h00 ngày 17 tháng 11 năm 2017

Địa chỉ nơi họp: UBND xã Phú Lợi, huyện Thanh Bình, tỉnh Đồng Tháp

1. Thành phần tham dự:

1.1. Đại diện địa phương:

- Đại diện Phòng Nông nghiệp huyện Thanh Bình
- Đại diện UBND các xã Phú Lợi và An Phong (Huyện Thanh Bình).
- Đại diện UBMTTQ các xã Phú Lợi và An Phong (Huyện Thanh Bình).
- Đại diện các cơ quan đoàn thể của các xã: Hội Nông dân, Hội Phụ nữ, Hội người cao tuổi, Ban chỉ huy quân sự, Ban Tài chính, Phòng Địa chính....
- Đại diện của các hộ dân trong vùng dự án, vùng ảnh hưởng của dự án.

1.2. Đại diện Chủ dự án: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp - Sở Nông nghiệp và PTNT Đồng Tháp.

1.3. Đơn vị tư vấn lập báo cáo đánh giá tác động môi trường: Bà Vũ Nguyễn Hoàng Giang và ông Nguyễn Kim Duyệt .

(Danh sách đại biểu tham dự được đính kèm)

2. Nội dung và diễn biến cuộc họp:

2.1. Đại diện UBND xã chủ trì cuộc họp thông báo lý do cuộc họp và giới thiệu thành phần tham dự.

2.2. Chủ dự án và đơn vị tư vấn trình bày tóm tắt báo cáo ĐTM của dự án gồm các nội dung của dự án, các tác động tích cực và tiêu cực của dự án đến môi trường và sức khỏe cộng đồng, các biện pháp giảm thiểu.

- Chủ dự án: Trình bày các thông tin chính về việc đầu tư công trình trong dự án.

- Đơn vị tư vấn: Bà Vũ Nguyễn Hoàng Giang - Viện Khoa học Thủy lợi miền Nam thay mặt chủ đầu tư trình bày báo cáo đánh giá tác động Môi trường của dự án.

2.3. Thảo luận, trao đổi giữa cộng đồng dân cư chịu tác động trực tiếp với chủ dự án, Ủy ban nhân dân cấp xã về các vấn đề mà chủ dự án đã trình bày tại cuộc họp:

- Ý kiến 1: CT xã Phú Lộc

+ Thảo luận với nhà đầu tư dự án.
 Dự án sẽ tác động đến kinh tế, thu nhập của X dân.
 + Mọi môi trường sản xuất trên khai

- Trả lời của đơn vị tư vấn:

- Ý kiến 2: Bà Văn Phức, ấp 4, xã Phú Lộc.
 Dự án có thu mua gạo, nguồn gạo sản phẩm
 có bán cho nông dân không?

- Trả lời của đơn vị tư vấn:

Dự án hỗ trợ phát triển thương hiệu, tìm
 kiếm ra các sản phẩm chủ lực thu mua.

- Ý kiến 3:

Xã An Phú
Thấy nhất với các đơn mô hình của địa
phương
để xuất cư hoá nội đơn ở rạch TB-TN đơn
qua xã An Phú để dân chủ yếu đi lại
để s/c sản phẩm nông nghiệp

▪ Trả lời của đơn vị tư vấn:

Đi từ văn sẽ chuyển kinh tế chủ đầu tư
để xem xét.

- Ý kiến 4:

Ngã Văn Trạng - Phú Lũ
Đã có hồ sơ chuyển nhượng đất đai một số
đất của các công nhân?

▪ Trả lời của đơn vị tư vấn:

Trên hồ sơ, hai sẽ được chuyển theo
chức năng của WB & quy định của pháp luật VN.

- Ý kiến 5: Ng. Văn Phong - Xã An Phú
Đoạn, bị rap thì bị tam này qua xã An Phú
có hiện trường báo về - cũng như là P. 0

▪ Trả lời của đơn vị tư vấn: Đoạn này tam này là nằm tại khu vực
TDA. Đơn vị tư vấn sẽ chụp lý do để đưa ra
để đi xem xét.

- Ý kiến 6: Ng. Văn Quỳ - Xã Phú Lễ
+ Đây là vấn đề cần.

▪ Trả lời của đơn vị tư vấn:

3. Kết luận:

Nội dung của cuộc họp đã được đọc lại cho các đại biểu tham gia cùng nghe và các đại biểu tham dự đồng ý với nội dung của biên bản và mong muốn dự án sớm được thực hiện.

ĐẠI DIỆN TƯ VẤN
(Ký, ghi họ tên)



Vũ Nguyễn Hoàng Giang

ĐẠI DIỆN CHỦ DỰ ÁN
(Ký, ghi họ tên)



Nguyễn Quốc Hải

ĐẠI DIỆN UBND
(Ký, ghi họ tên)

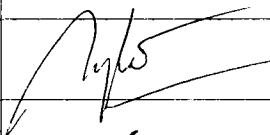
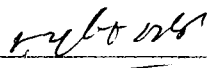


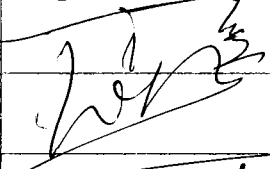
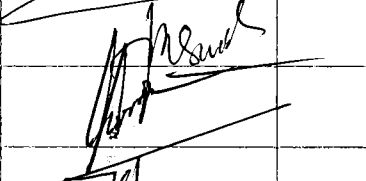
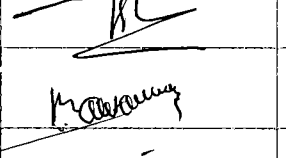

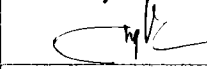


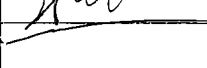
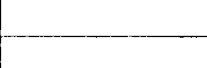



Nguyễn Thanh Hùng

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

Đồng Tháp, ngày 17... tháng 11... năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
01	Lý Thanh Tâm	Phong NN & PTNT		
02	Nguyễn Văn Phấn	ấp 4, Phú Lôi		
03	Điền Văn Phức	ấp 4, Phú Lôi		
4	Ngô Văn Quới	ấp 4 Phú Lôi		
5	Lê Văn Cánh	MIAO XA		
6	Ngô Văn Hợp	ấp 4		
7	Phạm Thị Thục Trinh	ấp 2		
8	Ngô Văn Đạt	ấp 4		
9	Đào Ngọc Châu Linh	CC NN. XDNN.		
10	Ngô Thanh Hùng	16140 xã Phú Lôi		
11	Lê Thị Minh Ngọc	Phú Lôi		
12	Nguyễn Thị Mỹ	Phú Lôi		
13	Lê Thị Kim Hạnh	Phú Lôi		
14	Nguyễn Đức Tiến	Phú Lôi		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**


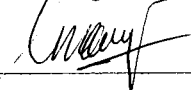

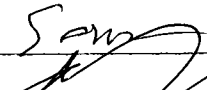
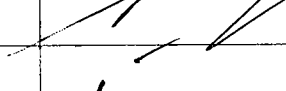
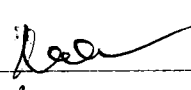
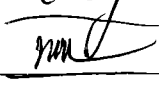
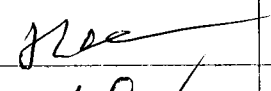
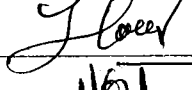
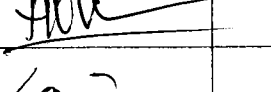

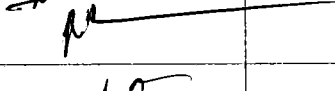
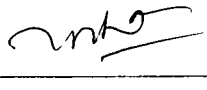
Đồng Tháp, ngày 17... tháng 11... năm 2017

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Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN

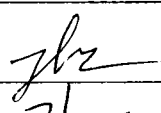



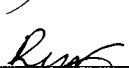
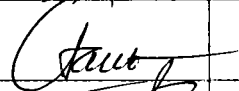
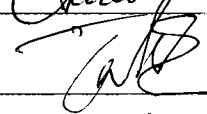
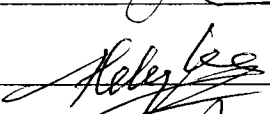

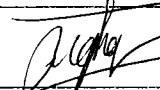
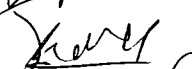
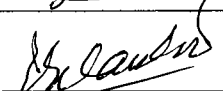

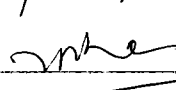
Đồng Tháp, ngày 17 tháng 11 năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
1	Lê Văn Hồ	Xã An Phú		
2	Lê Minh Quang	ut		
3	Fam Văn Nhe	ut		
4	Phạm Châu Sơn	ut		
5	Thyng Thi Kỳ	ut		
6	Đông Thị Liên	Xã Phú Lợi	Liên	
7	nguyễn thị kim xa	"		
8	Đỗ thị thủy	"	thủy	
9	Huỳnh thị nèn	"		
10	nguyễn thị ngọc nga	"		
11	Bùi văn khai	"		
12	trần văn Hoàng	"		
13	nguyễn ngọc ngân	"	Ngân	
14	trần văn khai	"		
15	Đỗ văn minh	"		
16	Lưu Nguyễn Hằng Giang	viện CATTM		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

Đồng Tháp, ngày 10 tháng 4 năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
1	Trần Thị Phò	Ấp 1, An Bình B		
2	Lê Thị Trúc Mai	Xã An Bình A		
3	Trần Trung Tín	UBTX		
4	Nguyễn Văn Giảng	Xã Bình Thới		
5	Đặng Văn Dũng	An Bình B		
6	Thái Văn Đức	Tân Hội		
7	Đặng Văn Phấn	An B		
8	Nguyễn Văn Tiến	AB B		
9	Lê Văn Dũng	Tân Hội		
10	Ngô Hoàng Vũ	An Bình A		
11	Phạm Văn Kiệt	phòng Kinh tế TX HN		
	Trương Văn Nhứt	Bình Thạnh		
	Lê Văn Hùng	An. Kinh B.		
	Uỷ Nguyễn Trọng Gray	Hội đồng		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN

Đồng Tháp, ngày 16... tháng 11... năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
01	Nguyễn Xuân	An Bình A	VS nam	
	Trần Văn Thái	Bình Thôn	Chanh	
	Trần Thái Nguyên	"	phuc	
	Lê Phú Hải	Xã Tân Hòa	Truc	
	Nguyễn Văn Bình	Xã Bình Thạnh	ngb	
	Phan Thị Mỹ Tâm	Xã An Bình B	Th	
	Nguyễn Thị Long	Xã Bình Thạnh	phuc	
	Nguyễn Thị Mỹ	An Bình B	Th	
	Phạm Văn Tâm	An Bình B	Spk	
	Nguyễn Văn Tâm	Bình Thạnh B	Pho	
	Ng Văn Hiền	BB	pho	
	Nguyễn Văn Cường	BT	pho	
	Trần Văn Cường	BT	Emilia	

Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

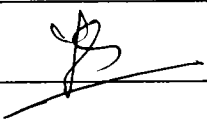
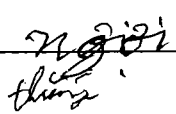




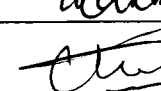


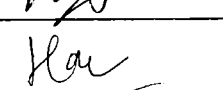
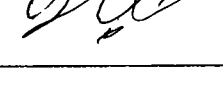

Đồng Tháp, ngày 16 tháng 11 năm 2017

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Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

Đồng Tháp, ngày ..10.. tháng 11..... năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
	Tô Văn Kiệp	Ấp 6 xã Trường Thọ Huyện B		
	Huỳnh Văn Ngời	xã Thuận Thới Đạo		
	Trương Văn Thắng	xã Thuận Thới Đạo A		
	Nguyễn Thị Diệu	xã TT Huyện B		
	Đường Xuân Khanh			
	Trần Văn Long	xã TT Huyện B		
	Tỷ Văn Hiến	xã TT Huyện A		
	Lý Thị Nui	T ² Huyện B		
	Lê Văn Mỹ	T Huyện A		
	Phạm Thanh Nhì	Phường NN-PTMT		
	Châu Xuân Cẩn	Cán bộ UBND xã		
	Mỹ Văn Tuấn	B/CT HĐND xã TT Huyện A		
	Huỳnh Phú Em	CCĐC NN xã TT Huyện A		
	Lê Hoàng Sơn	CCVP UBND xã		
	Nguyễn Văn Bì	CCVP UBND xã		
	Võ Văn Cao	TTT		
	Nguyễn Văn Thảo	P. An Lạc		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

Đồng Tháp, ngày ..b.. tháng ...l.. năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
	Lê Văn Hoát	Thường Thới Hậu B	Hoát	
	Phan Văn Chiến	Thường Thới Hậu A	Chiến	-
	Lê Văn Đoàn	Thường Thới Hậu A	Đoàn	
	Nguyễn Cơ Sang	Thường Thới Hậu A	Sang	
	Nguyễn Văn Linh	Thường Thới Hậu A	Linh	
	Ngô Hữu Phan	Thường Thới Hậu B	Phan	
	Trần Hải Quân	Thường Thới Hậu B	Quân	
	Nguyễn Quốc Việt	Thường Thới Hậu A	Việt	
	Nguyễn Thuận	Thường Thới Hậu A	Thuận	
	Bùi Văn Sơn	"	Sơn	
	Dương Công Bằng	"	Bằng	
	Nguyễn Thị Lành	Thường Thới Hậu A	Lành	
	Nguyễn Thanh Nhân	Thường Thới Hậu B	Nhân	
	Đỗ Chí Lực	P. Thới Mỹ T. NM	Lực	
	Đỗ Thị Duyệt	CT. CT. T. Hậu A	Duyệt	
	Lê Thị Thuý	CT. H. L. H. xã TP.	Thuý	
	Nguyễn Văn Hùng	CT. H. C. B. xã TP.	Hùng	
	Nguyễn Chí Bằng	Mỹ Nam - T. H. A	Bằng	

Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**




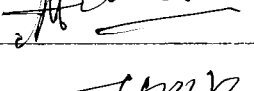
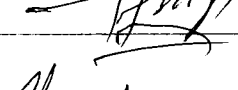

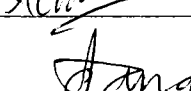
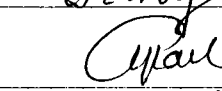
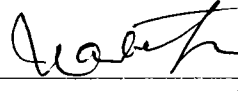
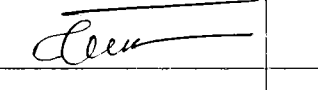



Đồng Tháp, ngày ...16... tháng ...11... năm 2017

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Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN

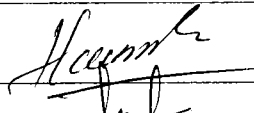
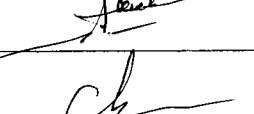
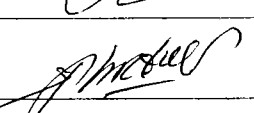
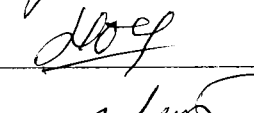
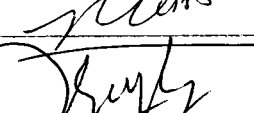
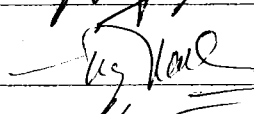
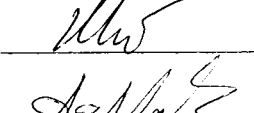
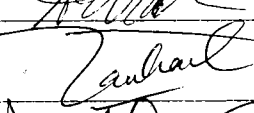

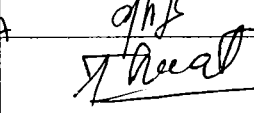
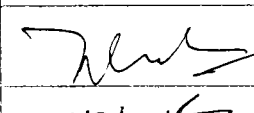
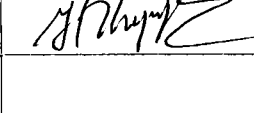



Đồng Tháp, ngày 17 tháng 11 năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
	Phạm Thanh Hùng	BT-Đai Xã Phú Ninh		
	Lâm Văn Gôn	CT-MITAVN Phú Ninh		
	Trần Thị Trúc Giang	CT-HLHPN Phú Ninh		
	Phan Văn Bền	Nông dân		
	Ngô Văn Miếu	Nông dân		
	Ngô Tôn Hỷ	Nông dân		
	Huyền Ngọc Chung	Phòng NN & PTNT		
	Nguyễn Văn Đăng	Ấp A xã Phú Thọ		
	Ngô Văn Cầu	Ấp A xã Phú Thọ		
	Ngô Thanh Nghiệp	Ấp B xã Phú Thọ		
	Lê Văn Bền	ĐSĐC		
	Ngô Thanh Lâm	Xã Phú Thiện H		
	Uông Nguyễn Hoàng Giang	Viện KHTN		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN

Đồng Tháp, ngày ... tháng ... năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
	Lương Minh Hên	ấp Phú Thọ A		
	Trịnh Văn Lương	Hồng Dân ở số 5		
	Ngọc Hải Ngọc Châu	Hồng Dân ở số 5		
	Phan Văn Đức	Nông Dân ở số 5		
	Nguyễn Văn Hồng	Nông Dân ở số 14		
	Trần Văn Lâm	Phú Thạnh A		
	Nguyễn Thanh Phú	Phú Thạnh A		
	Nguyễn Văn Tuấn	Phú Thạnh A		
	Trần Văn Mỹ	Phú Thạnh A		
	Nguyễn Văn Hải	Phú Thạnh A		
	Đông Tấn Hải	Trần Thanh Xã		
	Đông Hải An	Vĩnh An		
	Lê Thị Thuý An	NPTK xã Phú Thạnh		
	An Văn Tuấn	PC. UBND xã A		
	Mỹ Văn Nhật	CF. MTK xã Phú Thạnh		
	Hoàng Thị Tiến	CC. VPTK		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

Đồng Tháp, ngày ..17 tháng ..11... năm 2017

[illegible]

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

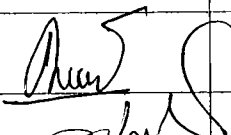
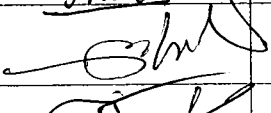
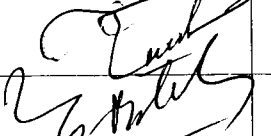
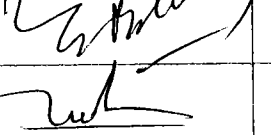
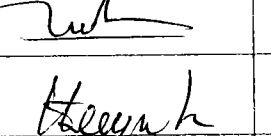
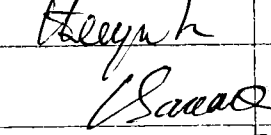
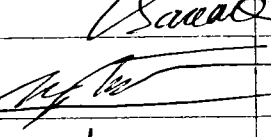
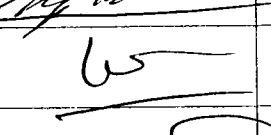
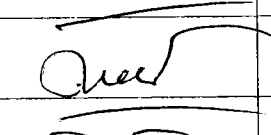
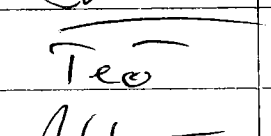
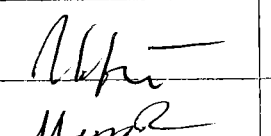
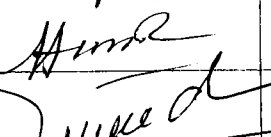
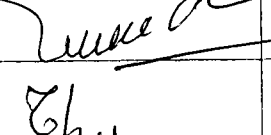
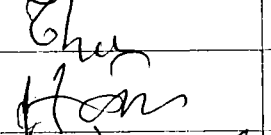
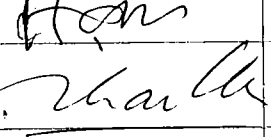
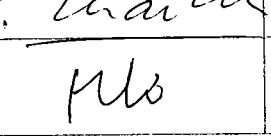
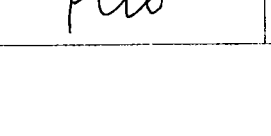

Đồng Tháp, ngày ..[7].. tháng ..[1].. năm 2017

[illegible]

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

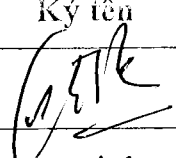
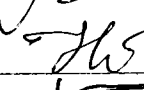
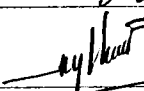
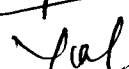
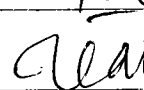
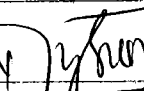


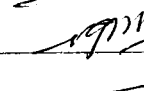

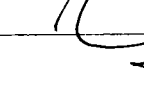
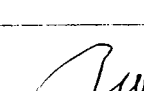
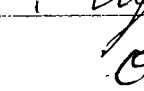
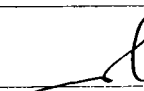

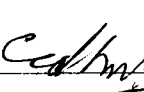
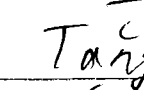
Đồng Tháp, ngày 17 tháng 11 năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
1	Lê Thành Dũng	Huỳnh A L T N D T		
2	Nguyễn Quốc Hưng	An Long T N D T		
	Trần Văn Sẻ	An Long		
4	Lê Bá Linh	Xã Phú Thạnh B		
5	Huỳnh Văn Tiến	ND xã Phú Thạnh B		
6	Phạm Văn Thành	Xã Phú Thạnh B		
7	Phạm Quốc Sư	Ấp 4 Xã Phú Thạnh B		
8	Trần Văn Hòa	Ấp III A H		
9	Đặng Văn Bên	An Long T N D T		
10	Đặng Văn út	An Long T N D T		
	Nguyễn Văn Tèo	An Long		
	Xy Kiệt Hưng	An Long		
	Lê Văn Hào	An Hòa		
	Trần Công Điền	An Hòa		
	Nguyễn Thị Như	An Hòa		
	Đoàn Văn Hào	An Hòa		
	Phạm Văn Thành	An Long		
	Trần Thị Phở	An Hòa		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN


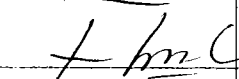





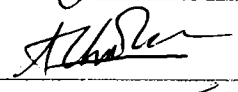

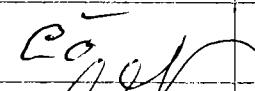
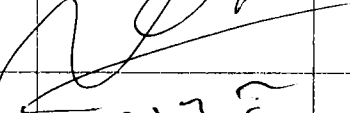
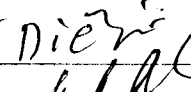

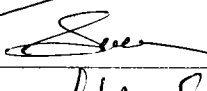
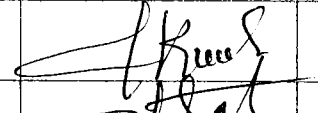
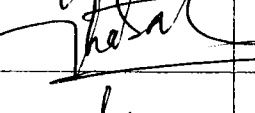


Đồng Tháp, ngày .../7 tháng .../11 năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
	Hà Văn Kiều	An Long		
	Đường Văn Hiếu	Huỳnh thành B		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		
	Nguyễn Thị Ngọc Thơ	xã An Long		

Tiểu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN


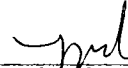

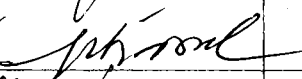

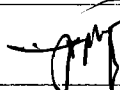
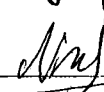
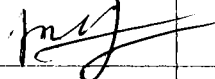
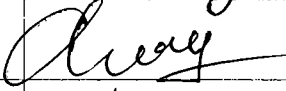
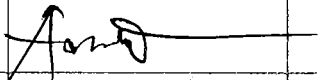
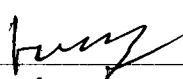
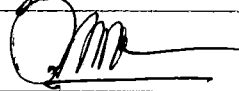
Đồng Tháp, ngày 17 tháng 11 năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
	Trần Văn Bền	An Long		
	Lê Thanh Phấn	PC. UBND xã An		
	Nguyễn Thị Hiền	Nông Nghiệp A H		
	Ngô Thị Hằng Thuỳ	Ct Hội Nữ dân AL		
	Lê Văn Thọ	KT THỊ P Long ph		
	Lương Văn Mộng	GD NTX Phú AN PTB		
	Cổ Mỹ Hoàng	CH N D Phú Thành B		
	Nguyễn Ngọc Chung	phòng NN & PTNT		
	Nguyễn Văn Khoa	Phù Thành B CH P		
	Lê Văn Cồ	Nông dân An Hòa		
	Trần Tớt	ND An Hòa		
	Cổ Văn Diễm	An Hòa		
	Nguyễn Bắc Ba	CT. UBND M Hòa		
	Nguyễn Văn Sỹ	PC. UB MTTQ VN		
	Nguyễn Văn Kinh	HIA. An phước		
	Lê Thị Thanh Nhàn	PC. PTN xã PTB		
	Phạm Minh Trí	UBND xã An Long		
	Lê Văn Cồn	An Hòa		

Tiêu dự án: Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)

**DANH SÁCH ĐẠI BIỂU THAM DỰ THAM VẤN CỘNG ĐỒNG
BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG CỦA DỰ ÁN**

Đồng Tháp, ngày ..17.. tháng ...11.. năm 2017

TT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
1	TRẦN VĂN TUẤN	An Long		
2	Phạm Thị Nhơn	An Hòa		
3	Hà Duy Huy	An Hòa		
4	Nguyễn Hữu Ngân	PCT UBND huyện	Ngân	
5	Phạm Văn Lâm	CT MTTQ xã		
6	Lê Đức Nghĩa	An Hòa		
7	Lê Văn Trường	An Hòa		
8	Trần Thị Mỹ Anh	An Hòa		
9	Huỳnh Văn Dũng	An Hòa		
10	Dương Văn Chấn	An Hòa		
11	Trần Văn Chấn	nt	Chấn	
12	Nguyễn Thanh Cường	nt		
13	Nguyễn Văn Lâm	nt	Lâm	
14	Võ Minh Tuấn	nt		
15	Võ Văn Hùng	nt	Hùng	
16	Nguyễn Minh Hải	nt		
	Uỷ Nguyễn Hoàng Giang	Viện KIMM	Giang	

ỦY BAN NHÂN DÂN
XÃ AN BÌNH A
THỊ XÃ HỒNG NGỰ

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

Số: 42/UBND

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

An Bình A, ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 421/CN.BHL.TC.SL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động tiêu cực được trình bày trong báo cáo.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các biện pháp giảm thiểu đã nêu.

.....
.....
.....
.....

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

- Yêu cầu chủ dự án thực hiện đủ và đúng trách nhiệm trước, trong và sau khi thực hiện dự án theo cam kết.

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. ỦY BAN NHÂN DÂN
CHỦ TỊCH



Ngô Hoàng Vũ

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: An Bình

Độc lập - Tự do - Hạnh phúc

Huyện: T.X. Hồng Ngự

Số: 52/M.T.A

An Bình, ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 421/CV-BQLĐT.X.L ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động đã đề cập đến trong báo
cáo

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Đồng ý với dự án

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

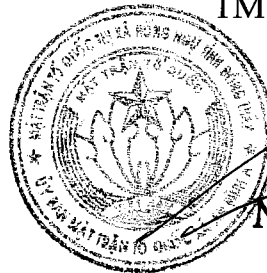
Đề nghị thi công đúng tiến độ và chất lượng công trình

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. MTTQ Xã



Nguyễn Văn Hiến

ỦY BAN NHÂN DÂN

Xã: Đông Bình

Huyện: Thị xã Hồng Ngự

Số: 162/VNP

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Đ. Bình, ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 41/CV.BQLICRSL... ngày 12 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với nội dung báo cáo

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Sơn Thúc Hiền đi ăn

Nguyễn Văn Hiếu

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: *An Bình B*.....

Độc lập - Tự do - Hạnh phúc

Huyện: *Đ.X...Hưng Yên...*.....

Số:*31/MTB*.....

Hưng Yên..., ngày *16* tháng *11* năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số *421/O.ĐTL*..... ngày *15*.. tháng *11*... năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “*Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)*”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (*nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý*).

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (*nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý*).

Đồng ý ☒

Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Sơ lược triển khai dự án

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



ỦY BAN NHÂN DÂN

Xã: Tân Hội.....

Huyện: Hồng Ngự.....

Số: 907.....

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Tân Hội, ngày 14 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 421/CN-ICRSL..... ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với dự án

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với dự án!

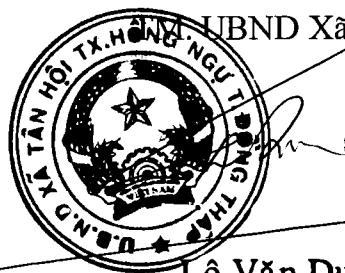
3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

+ Kiến nghị chủ dự án bởi thường thỏa
hàng cho người dân
+ Chi công tạm báo chất lượng
+ Hồ sơ văn bản luật cho người dân

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



Lê Văn Duẩn

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Tân Hưng

Độc lập - Tự do - Hạnh phúc

Huyện: Thị xã Đông Tháp

Số: 784

Tân Hưng, ngày 20 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 411/W.BM.ICRSL ngày 15 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động đã nêu trong tài
liệu kèm theo.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các biện pháp đã nêu.

3. Kiến nghị đối với chủ dự án: *nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).*

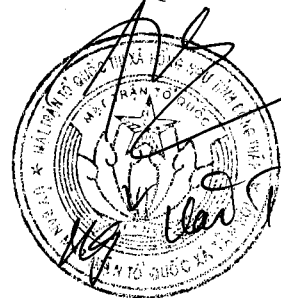
Không có kiến nghị gì

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. MTTQ Xã



Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Chủ dự án cam kết thực hiện đúng các nội dung đã được nêu trong báo cáo Hồ sơ Kỹ thuật và vốn cho người dân trong các mô hình sinh kế

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

TM. UBND Xã

Nơi nhận:

- Như trên;
- Lưu VT.



Trương Văn Thành

ỦY BAN MẶT TRẬN TỔ QUỐC

Xã: Bình phước

Huyện: Đ. X. H. N.

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Số: 578

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

B. 5, ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 421/V. H. L. ICRSL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

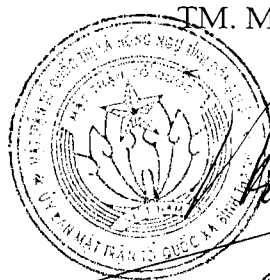
Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



TM. MTTQ Xã

Trịnh Thái Nguyên

ỦY BAN NHÂN DÂN
Xã: Thường Thới Hậu A
Huyện:Hồng Ngự....

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

Số:32/WBND
V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Thường Thới Hậu A ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 421/WBND ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động đã nêu trong báo cáo

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

- Tóm tắt lại dự án
- Chủ dự án thực hiện đúng cam kết đã nêu.

The graph illustrates the projected increase in the percentage of the population aged 65 and over. The solid line (a) represents a higher projection, while the dashed line (b) represents a slightly lower projection. Both show a steady upward trend over the 100-year period.

Year	Line a (%)	Line b (%)
1950	7	7
1960	8.5	8.2
1970	10	9.5
1980	11.5	10.8
1990	13	12
2000	14.5	13.2
2010	16	14.5
2020	17.5	15.8
2030	18.5	16.8
2040	19	17.2
2050	19.5	17.5

Nơi nhận:

- Như trên;
- Lưu VT.

TM. UBND Xã



- Lum VT.



Châu Văn Gấm

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Thị trấn Hậu A

Độc lập - Tự do - Hạnh phúc

Huyện: Hồng Ngự

Số: 315

T. H. A., ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 421/UB-MT ICRSL ngày 13
tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo
cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát
triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện,
thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã
có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã
hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình
bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ
thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động đã nêu trong báo cáo.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên,
kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các
nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý
thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các biện pháp giảm thiểu nêu trong báo cáo

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

- Kiến nghị chủ dự án: Sớm thực hiện chủ án.

- Đề nghị hỗ trợ vốn và kỹ thuật cho người dân chuyển đổi sinh kế.

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án/.

Nơi nhận:

- Như trên;
- Lưu VT.



Ty Văn Hiên

ỦY BAN NHÂN DÂN
Xã: Tôn Lũng, Tân Hải B
Huyện:

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

Số: 18/WND
V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

T.T. Hải Ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 424/NICSTLM ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với dự án

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với dự án

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Thi công đúng tiến độ và đảm bảo chất lượng

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. UBND Xã

PHÓ CHỦ TỊCH



Lê Văn Hùng

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Thường Thới Hậu B

Độc lập - Tự do - Hạnh phúc

Huyện: Hồng Ngự.....

Số: 107/MTB

T.T.H.A ..., ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 421/UB-MT ICRSL ngày 15 tháng 10 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với các tác động đã nêu trong tài liệu kèm theo

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Nhất tề và các biện pháp giảm thiểu đã nêu trong tài liệu kèm theo

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Không có ý kiến.

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



ỦY BAN NHÂN DÂN
Xã: Thị trấn Phú
Huyện: Đông Tháp

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

Số: 222/UBND
V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Tuy Phước ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 421/CL BAN ICRSL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động đã nêu

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đóng ý và giải pháp, đồng và biện pháp để
nên trong báo cáo.

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Chủ dự án cam kết thực hiện đúng các cam kết
đã nêu.

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



TM. UBND Xã

Phạm Hồng Cường

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Thị trấn Phước Mỹ

Độc lập - Tự do - Hạnh phúc

Huyện: Thị trấn Phước Mỹ

Số: 204

T.T.A....., ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 421/UV-BM ICRSL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiêu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiêu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động trong báo cáo

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đúng ý với dự án.

3. Kiến nghị đối với chủ dự án: *nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).*

Không ý kiến.

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiêu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



MTTQ Xã

Châu Văn Lơ

ỦY BAN NHÂN DÂN

Xã: AN HÒA

Huyện: THANH HÓA

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Số: 420/U.ND-KT

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

An Hòa, ngày 17 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 420/U.ND-KT ngày 17 tháng 11 năm 2017 của Ban Quản lý Tiêu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiêu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với dự án

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với dự án

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

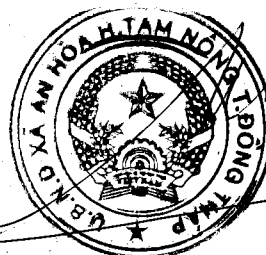
Thực hiện dự án

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiêu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

TM. UBND Xã

Nơi nhận:

- Như trên;
- Lưu VT.



Nguyễn Bé Ba

ỦY BAN MẶT TRẬN TỔ QUỐC CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: AN HÒA

Độc lập - Tự do - Hạnh phúc

Huyện: TAM NÔNG

Số: 12/CV.MT

An Hòa, ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 424/VKHTLMN ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiêu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiêu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. MTTQ Xã



[Handwritten signature]
Phạm Văn Lâm

Số: 157/ CV-UBND

Phú Thành B, ngày 17 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía Bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã Phú Thành B nhận được Văn bản số 422/VKHTLMN ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo tóm tắt đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười”. Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội:

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng:

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm.

3. Kiến nghị đối với chủ dự án:

- Đề nghị Chủ dự án thực hiện tốt các cam kết với cộng đồng trong quản lý môi trường tự nhiên và xã hội; tuân thủ các quy định chung về bảo vệ môi trường, thực hiện tốt các giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên và kinh tế - xã hội.

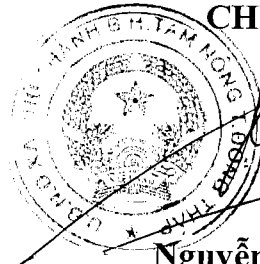
- Đề nghị Chủ dự án thực hiện tốt các giải pháp khắc phục ô nhiễm môi trường nếu để xảy ra các sự cố môi trường từ tác động của dự án.

Trên đây là ý kiến của Ủy ban nhân dân xã Phú Thành B gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như kính gửi;
- TT.ĐU; TT.HĐND xã (b/c);
- Lưu VT.

**TM. ỦY BAN NHÂN DÂN
CHỦ TỊCH**



Nguyễn Văn Minh

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: *Phước Thuận B...*

Độc lập - Tự do - Hạnh phúc

Huyện: *Sơn Tây...*

Số: *87/MTD*

Phước Thuận ngày *18* tháng *11* năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số *424/VKHTL/UN* ngày *13* tháng *11* năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

*Báo cáo Sau khi được lập theo các
đồng ý với các nội dung này. Các
hạt động ảnh hưởng đến môi trường của dự
án, các tác động ở mức chấp nhận được, trong
ngắn và sẽ kết thúc sau khi hoàn thiện.*

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

- Đặt cả những người bị ảnh hưởng sẽ được hưởng quyền đến bù cho thiệt hại về đất và tài sản

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

- Chủ dự án thực hiện đầy đủ trách nhiệm trước nhân dân, nghị quyết số 18/2015/QH-CP của Quốc hội ban hành ngày 14 tháng 02 năm 2015 quy định về giải quyết mọi vướng mắc, khiếu nại, tố cáo của công dân mọi trường hợp và mọi trường hợp sau khi TĐA được phê duyệt báo cáo ĐTM.

- Có trách nhiệm hợp tác và tạo điều kiện thuận lợi để cơ quan, quản lý nhà nước tiến hành các hoạt động giám sát, kiểm tra việc thực hiện các nội dung báo cáo và mọi trường hợp của TĐA cung cấp đầy đủ các thông tin, số liệu có liên quan.

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiêu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Phu Thọ

Độc lập - Tự do - Hạnh phúc

Huyện: Tam Nông

Số: 194

PT, ngày 17 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 41/W-BAL-ICRSL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với nội dung báo cáo

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Đồng ý với nội dung báo cáo

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Kiến nghị chủ dự án thực hiện đúng cam kết đề ra.
Bồi thường thiệt hại cho người dân.

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



TM. MTTQ Xã

Nguyễn Văn Nhật

ỦY BAN NHÂN DÂN
Xã: Phước Thọ
Huyện: Đạm Nong

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

Số: 563/UBND
V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

17....., ngày 17 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 421/UBND ICRSL ngày 12 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với các tác động nêu trong
báo cáo.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Nhất trí với các nội dung nêu trong báo cáo

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Kiến nghị thi công đúng tiến độ, thi công cuốn chiếu, không đến trái và đảm bảo chất lượng công trình

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. UBND Xã

CHỦ TỊCH



Văn Phòng

ỦY BAN NHÂN DÂN
Xã: PHU NINH
Huyện: TAM NÔNG

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

Số: 83/UBND
V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Phu Ninh, ngày 16 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 422/VKHTL/UBND ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiêu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiêu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nếu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

a. Tác động tiêu cực của không liên quan đến chất thải như:
- Thay đổi sử dụng đất: chuyển đổi hoạt động sản xuất, chăn nuôi theo hướng phù hợp với đầu vào nguồn nước (ô nhiễm của nước máy mà hình cũng sẽ không liên quan thay đổi mục tiêu sử dụng đất trong vùng.

- Tác động của môi trường sinh thái

b. Tác động tiêu cực liên quan đến chất thải:

- Chất thải từ hoạt động nuôi trồng thủy sản
Đồ dùng nuôi sử dụng nghịch thái ảnh hưởng tự nhiên nên không làm ảnh hưởng tới hoạt động này đến môi trường là rất ít.
- Chất thải từ công việc: các mô hình sản xuất được đầu tư phát triển theo các hướng cơ, tiểu nông, sản xuất từ 1-2 vụ nên sẽ giảm nguy cơ phát sinh chất thải

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

- Biện pháp giảm thiểu tác động trong giai đoạn chuẩn bị mặt bằng
 - Biện pháp giảm thiểu tác động trong giai đoạn thi công xây dựng
 - Biện pháp giảm thiểu tác động trong giai đoạn đi vào khai thác sử dụng
- ⇒ Thống nhất với các nội dung trong báo cáo các tác động môi trường.

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



M. UBND Xã

Hạ Văn Minh

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Phú Ninh

Độc lập - Tự do - Hạnh phúc

Huyện: Tam Nông

Số: 473

Phú Ninh, ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 421/V-BA/ICRSL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Thống nhất với các nội dung về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội của Ban Quản lý Tiểu dự án đã trình bày trong báo cáo.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Thống nhất với các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và

Sức khỏe cộng đồng của Ban Quản lý Tiểu dự án đã
nên trong báo cáo

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



ỦY BAN NHÂN DÂN
Xã: Phú Thành A.....
Huyện: Hòa Ninh.....

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

Số: 192 / UBND
V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Phú Thành A, ngày 17 tháng 11 năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 421 / UBND ICRSL ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đồng ý với các tác động đã được đề cập
trong tài liệu gửi kèm.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Đề nghị ý kiến các biện pháp để ra

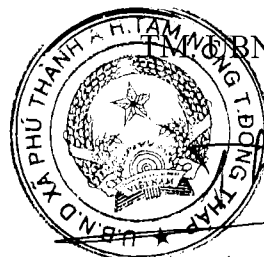
3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Kiến nghị chủ dự án thực hiện đúng Cam kết đã nêu.
Đóng thời gian nhanh tiến độ thực hiện dự án

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



An Văn Thiện

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Phú Thành A.....

Độc lập - Tự do - Hạnh phúc

Huyện: Tam Nông.....

Số: 44.....

PTA, ngày 17 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 44/UBMT ICRSL ngày 12 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiêu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



ỦY BAN NHÂN DÂN

Xã: *Am Long*

Huyện: *Tam Nông*

Số: *219/UBND*

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Am Long, ngày *17* tháng *11* năm 2017

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số *421/VN-BQLICRSL* ngày *13* tháng *11* năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nếu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

*Đồng ý với các nội dung tương ứng
được trình bày trong tài liệu gửi kèm*

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nếu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Đồng ý với cái nội dung tương ứng
chưa trình bày trong tài liệu.

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



TM. UBND Xã An Long
PHÓ CHỦ TỊCH

Phạm Phú

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: AN LUY

Độc lập - Tự do - Hạnh phúc

Huyện: ...T.ATM...N.ONS

Số: 102/VMT

An Luy, ngày 17 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số ngày tháng năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

Sau khi nghiên cứu tài liệu & tham khảo các
nội dung được trình bày tại hồ sơ: thông nhất
đồng ý các nội dung tương ứng được trình bày.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.

Đồng ý ☒

Không đồng ý ☐

Đồng ý các nội dung tương ứng được
trình bày cũng như tài liệu gửi kèm.

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Không có ý kiến gì thêm ./

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



TM. MTTQ Xã

Nguyễn Thị Hoàng Liên

ỦY BAN NHÂN DÂN

Xã: Phú Lợi

Huyện: Thanh Bình

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Số: 42 / ... UBND

Phú Lợi ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 422/VKHTLMN ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

- Về mặt xã hội: diện tích đất dự án chiếm dụng để xây dựng công trình sẽ được dự án bồi thường và hỗ trợ thỏa đáng, đồng thời trong quá trình thực hiện sẽ có thể di dời một số ngôi mộ và phần kinh phí di dời cũng sẽ được dự án bồi thường và hỗ trợ hợp lý theo đúng quy định và trình tự thủ tục.

- Các hoạt động trong tiểu dự án chỉ giới hạn trong mức độ mô hình, không nhân rộng diện tích.

- Trong quá trình xây dựng các công trình của tiểu dự án sẽ tác động tiêu cực với môi trường và cộng đồng địa phương có tính chất vừa phải cục bộ và tạm thời có thể giảm thiểu. Chủ yếu là công tác giải phóng mặt bằng, vận chuyển các nguyên liệu vật tư trong quá trình xây dựng.

- Việc phát triển lớn một nhóm sản phẩm hàng hóa trong khi không có đầu ra để tiêu thụ có thể là yếu tố tác động tiêu cực đối với các mô hình trong tiểu dự án.

- Hầu hết người dân trong vùng dự án đều có mức sống trung bình, thấp và chưa qua đào tạo do đó việc tiếp nhận các khoa học kỹ thuật trong quá trình thực hiện các mô hình là điều cần chú ý.

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: *nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.*

Đồng ý ☒

Không đồng ý ☐

- Biện pháp giảm thiểu tác động trong giai đoạn chuẩn bị mặt bằng: được đảm bảo đúng trình tự thủ tục và quy định, công khai minh bạch trong quá trình thực hiện. Tất cả những người bị ảnh hưởng sẽ được hưởng quyền đền bù cho thiệt hại về đất và tài sản. người dân đến chính quyền địa phương cùng toàn thể được thông tin rộng rãi về dự án được biết để đóng góp ý kiến ngay từ khi chuẩn bị đầu tư xây dựng. Địa phương chủ động tiếp cận thông tin về dự án để có định hướng quy hoạch khai thác sử dụng hiệu quả các công trình được đầu tư xây dựng.

- Biện pháp giảm thiểu tác động trong giai đoạn thi công xây dựng: Đảm bảo an toàn giao thông đường thủy. Lắp đặt đầy đủ các biển báo hiệu, biển chỉ dẫn cho tàu thuyền lưu thông trên tuyến kênh Kháng Chiến và một số kênh rạch có tiến hành nạo vét. Buổi tối phải có đèn tín hiệu từ xa cảnh báo và chỉ đường cho tàu thuyền qua lại tránh va quệt.

- Biện pháp giảm thiểu tác động trong giai đoạn đi vào khai thác sử dụng: Tìm đầu ra ổn định cho tôm càng xanh, cá tự nhiên, lúa nổi, lúa hữu cơ, lúa sạch thông qua xúc tiến thương mại giới thiệu sản phẩm trên các hội chợ trong và ngoài nước. Tổ chức các lớp hướng dẫn người dân kỹ thuật chuyển đổi các mô hình sinh kế mới thông qua giới thiệu về lý thuyết, hướng dẫn trên mô hình và cử các đội khuyến nông, khuyến ngư xuống địa bàn hướng dẫn trực tiếp người dân chuyển đổi khi có nhu cầu

- Các biện pháp còn lại đảm bảo yêu cầu hướng đến việc bảo vệ môi trường và an toàn lao động trong quá trình thực hiện tiểu dự án.

3. Kiến nghị đối với chủ dự án: *nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).*

- Phối hợp đồng bộ với chính quyền địa phương trong công tác thực hiện đền bù và giải phóng mặt bằng tránh tình trạng khiếu nại trong dân, góp phần đẩy nhanh tiến độ thực hiện tiểu dự án.

- Đề nghị dự án tăng cường tập huấn kiến thức và hỗ trợ kinh phí cho các cán bộ trực tiếp theo dõi thực hiện các mô hình.

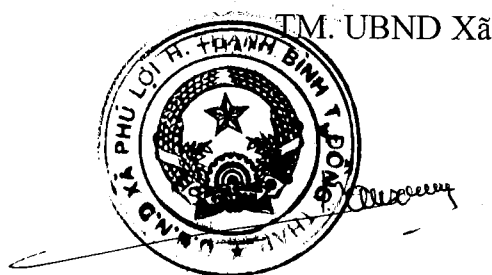
- Tăng cường tập huấn cho nông dân tranh khi thực hiện các mô hình để đạt hiệu quả kinh tế.

- Hỗ trợ kinh phí cho nông dân tham gia trực tiếp mô hình và bao tiêu thị trường đầu ra ổn định cho các sản phẩm mang lại từ mô hình.

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



TM. UBND Xã

Nguyễn Thanh Hùng

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: *Phước Lễ*

Độc lập - Tự do - Hạnh phúc

Huyện: *T. Thành B. Bình*

Số: *108/MTĐ*

..... *Phước Lễ*, ngày *16* tháng *11* năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA “Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)”

Kính gửi: Ban Quản lý Tiểu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số *44/UBMTICRSL* ngày *13* tháng *11* năm 2017 của Ban Quản lý Tiểu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiểu dự án “Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)”. Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: *(nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).*

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: *nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý.*

Đồng ý ☒

Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Chủ dự án phải hợp tác với chính quyền địa phương, Tỉnh/Chi lập dự án phải được cộng đồng, nhân dân địa phương từ có hồ sơ (nhất là các hạn mức bồi thường chi nhận đến).

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



Lê Văn Chi

ỦY BAN NHÂN DÂN

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: AT. PHUONG

Độc lập - Tự do - Hạnh phúc

Huyện: TH. H. B. H.

Số: 246/UMD

AT. PHUONG ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp

Ủy ban nhân dân xã nhận được Văn bản số 422/VKH.UMD ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiêu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiêu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, Ủy ban nhân dân xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

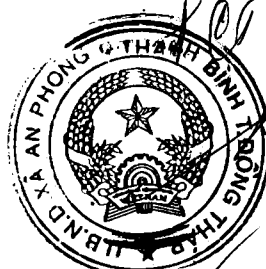
3. Kiến nghị đối với chủ dự án: nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).

Trên đây là ý kiến của Ủy ban nhân dân xã gửi Ban Quản lý Tiểu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.

TM. UBND Xã



Huỳnh Tri Kỳ

ỦY BAN MẶT TRẬN TỔ QUỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Xã: Thị trấn

Độc lập - Tự do - Hạnh phúc

Huyện: Chánh Bình

Số: 162/MTTQ

N. Phang, ngày 16 tháng 11 năm 2017

V/v ý kiến tham vấn về Báo cáo ĐTM
TDA "Nâng cao khả năng thoát lũ và
phát triển sinh kế bền vững, thích ứng với
khí hậu cho vùng Đồng Tháp Mười (các
huyện, thị phía bắc tỉnh Đồng Tháp)"

Kính gửi: Ban Quản lý Tiêu dự án ICRSL Đồng Tháp

Ủy ban Mặt trận Tổ quốc xã nhận được Văn bản số 422/VKMT/MN ngày 13 tháng 11 năm 2017 của Ban Quản lý Tiêu dự án ICRSL Đồng Tháp kèm theo báo cáo đánh giá tác động môi trường của Tiêu dự án "Nâng cao khả năng thoát lũ và phát triển sinh kế bền vững, thích ứng với khí hậu cho vùng Đồng Tháp Mười (các huyện, thị phía bắc tỉnh Đồng Tháp)". Sau khi xem xét tài liệu này, UB Mặt trận Tổ quốc xã có ý kiến như sau:

1. Về các tác động tiêu cực của Dự án đến môi trường tự nhiên và kinh tế - xã hội: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

2. Về các biện pháp giảm thiểu tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội và sức khỏe cộng đồng: (nêu rõ ý kiến đồng ý hay không đồng ý với các nội dung tương ứng được trình bày trong tài liệu gửi kèm; trường hợp không đồng ý thì chỉ rõ các nội dung, vấn đề cụ thể không đồng ý).

Đồng ý ☒

Không đồng ý ☐

3. Kiến nghị đối với chủ dự án: *nêu cụ thể các yêu cầu, kiến nghị của cộng đồng đối với chủ dự án liên quan đến việc cam kết thực hiện các biện pháp, giải pháp giảm thiểu các tác động tiêu cực của dự án đến môi trường tự nhiên, kinh tế - xã hội, sức khỏe cộng đồng và các kiến nghị khác có liên quan đến dự án (nếu có).*

Trên đây là ý kiến của UB Mặt trận Tổ quốc xã gửi Ban Quản lý Tiêu dự án ICRSL Đồng Tháp để xem xét và hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:

- Như trên;
- Lưu VT.



Đào Hoàng Thọ

APPENDIX 6: PICTURES RELATED TO THE SUBPROJECT

MỘT SỐ HÌNH ẢNH THAM VẤN CỘNG ĐỒNG



Tham vấn cộng đồng tại UBND Thị xã Hồng Ngự



Tham vấn cộng đồng tại UBND xã Thường Thới Hậu A, huyện Hồng Ngự



Tham vấn cộng đồng tại UBND xã An Hòa, huyện Tam Nông



Tham vấn cộng đồng tại UBND xã Phú Thành A, huyện Tam Nông



Tham vấn cộng đồng tại UBND xã Phú Lợi, huyện Thanh Bình

APPENDIX 7: DREDGED MATERIALS MANAGEMENT PLAN

1. Location of Dredging, Volume and Characteristics of Dredged Materials

In the subproject, with a total length of 37.244km of main canal routes (Canals of Khang Chien canal, Khang Chien 1, Hong Ngu-Tam Nong, Ca Cai and border canal of Thanh Binh-Tam Nong) will be dredged to increase the capacity of flood control and drainage.

There is about 418,816 m³ sludge from canal dredging. Based on the analysis result of sediment/soil samples in Chapter 2, with the pH values range from 4.94 to 5.66 and heavy metal contents are within the standard of QCVN 43:2012/BTNMT QCVN- National technical regulation on sediment quality and QCVN 03-MT:2015/BTNMT- National technical regulation on allowable limits of heavy metal in soils (agricultural production area).

2. Final Disposal Site

Total volume of sludge disposal is 418,816 m³, in which 271,858 m³ dredged by suction dredger and stored in 7 disposal sites along Khang Chien and Khang Chien 1 canals, in which 05 dump sites are currently earth ponds, which were exploited for filling residential areas, with depths ranging from 8-10m; and 2 others will be embanked to +5.2m to store dredged sludge.

In addition, the remaining of 146,958m³ sludge dredged by bucket dredger will be disposed of in the compartments along the canals.

3. Contractor's Dredging Management Plan

The Contractor is required to prepare a Contractor's Dredging Management Plan (CDMP) and submitted to the Environmental Consultant of the Construction Supervision team and the PPMU Environmental Officer for review and approval. The CDMP will include, but not limited to the followings:

- The Scope of Works in the Contract package, construction method and schedule
- Volume and quality of water quality and sediment quality in the dredging area covered by the contract.
- Water users that may be affected by the dredging
- Materials uploading and transportation method: indicate proposed route of the transport from the dredged site to the disposal area, time of operation, type of vehicles/trucks and proposed measures to reduce the leakage of the dredged materials from the transport means.
- Schedule to inform the nearby communities about the subproject, disclosure of name and contact number for possible complaints.
- Potential social and environmental impacts, including the site-specific impacts and risks
- Mitigation measures to address the potential impacts and risks. The mitigation measures should be proposed based on ESIA/ECOP, ESMP, SEMP, the potential impacts and mitigation measures presented in Section 4 and 5 of this Plan and the following requirements:
- Environmental Quality Monitoring plan carried out by the contractor (particularly pH, DO, TSS, BOD, salinity etc. for water and heavy metals including pH, Hg, As, Cd, Cu, Pb, Zn and Cr, Organic Materials and Mineral Oils for sediments and soil
- For soil and sediment: The number of samples taken will follow the following guidelines

- At least one water, soil and sediment sample must be taken for each contract package

Table 1: The number of Sediment samples

<i>The volume of dredged (m³)</i>	<i>No of Sediment Samples</i>
Up to 25,000	3
25,000 to 100,000	4-6
100,000 to 500,000	6-10
500,000 to 2,000,000	10-20
For each 1,000,000 above 2,000,000	Additional 10

- Consultation with the affected community about the draft CDMP
- Excavated soil is separated from dredged materials from source. Excavated soils will be reused on-site and off-site as much as possible and transported to the nearest disposal site appraised under ESIA, or identified and approved during detail engineering design or construction phase;
- The mitigation measures are adequate to address the potential social and environmental impacts associated with various steps and activities, areas of influence and receptors of dredging, temporary storage, transportation and final disposal of the dredged materials.
- Field survey is carried out by the Contractor during the preparation of the CDMP in order to identify if there are additional sensitive receptors not identified previously under the subproject and proposed additional site-specific mitigation measures accordingly.
- Contractor's environmental monitoring plan are included
- Commitments to carry out corrective actions when excessive pollution is determined, or when there are complaints about environmental pollution, social impacts from any stake holders.

4. Potential Impacts and Mitigation Measures for Dredging

Impacts and Description	Mitigation Measures
AT DREDGING AND TEMPORARY LOADING AREAS	
<p><i>Odour and air pollution, nuisance</i></p> <p>Decomposition of organic matters under anaerobic conditions generates strong odour generated gases such as SO₂, H₂S, VOC, etc. When the muds are disturbed and excavated, these gases are released much faster into the air. Exposure to odour pollution affect the health of workers, local residents and cause a public nuisance</p>	<ul style="list-style-type: none"> - Inform the community at least one week before dredging is started - Minimise the duration of temporary loading of dredged materials on-site - Temporary loading materials must be transported to the disposal site within 48 hours - Load the materials on-site tidily - Do not load the materials temporarily outside the construction corridor determined for each canal section - Avoid loading the sludge in populated residential areas or near public buildings such as kindergarten. Load the sludge as far from the houses and buildings as far as possible

	<ul style="list-style-type: none"> - Cover the temporary sludge loads when loading near sensitive receptors or longer than 48 hours unavoidable
<p><i>Dust and nuisance</i></p> <ul style="list-style-type: none"> - Temporary loading of sludge at the construction site cause nuisance to the public - Dry and wet mud may be dropped along the dredging area and on transportation route causing a nuisance to the public and traffic safety risks 	<ul style="list-style-type: none"> - Avoid temporary loading of dredged materials on-site - Dredged materials must be transported to the final disposal sites earliest possible and no later than 48 hours from dredging. - Use truck with water-tight tank to transport wet/damp dredged materials; - All trucks must be covered tightly before leaving construction site to minimise dust and mud dispersion along the road
<p><i>Traffic Disturbance</i></p> <p>The placement and operation of dredging equipment and construction plants on the ground, temporary loading of the dredged materials may obstruct or disturb traffic and cause safety risks for the people traveling on the canal-side road, particularly on the canal- crossing bridges which are usually very narrow</p>	<ul style="list-style-type: none"> - Arrange worker to observe and direct excavators driver when traffic is busy
<p><i>Social Disturbance</i></p> <ul style="list-style-type: none"> - The concentration of workers and equipment, construction works, temporary loading of materials and wastes, traffic disturbance, dust and odour pollution etc. will disturb daily activities and the lives of local residents - Conflicts may also arise if workers, waste, materials, equipment etc. are present outside the construction corridor 	<ul style="list-style-type: none"> - Inform the community at least one week before construction is started - Monitor to ensure that physical disturbances are within the construction corridors only - Contractor recruit local labors for simple works, brief them about project environmental and safety requirements before started working - Contractor register the list of workers who come from other localities to the commune at the construction site - Led the water leaked from wet/damp dredged materials going back to the river, not to affect garden or agricultural land - Keep the areas to be disturbed minimally - Enforce workers to comply with codes of conducts
<p><i>Landslide and soil subsiding risks at dredging area</i></p> <ul style="list-style-type: none"> - Relative deep excavation or cut and fills on the embankments that create slopes may lead to landslide and soil subsiding at the slops or excavated areas, particularly in rainy weather - Deep excavation also causes risks to the existing buildings nearby, particularly the weak structures or located too close to the 	<ul style="list-style-type: none"> - During field survey for the preparation of CDMP, the contractor in coordination with the Environmental Officer of PPMU and the Environmental Consultant of the CES identify weak structures that may be at risk and determine appropriate mitigation measures accordingly - Consider and select appropriate dredging method that allows minimising soil subsiding risks, for example carry out stepped

deep excavation area.	excavation, stabilise slopes in parallel to dredging - Apply protective measures such as sheet piles at risky locations
<i>Water Quality Degradation</i> - Turbidity in water will be increased when the mud is disturbed; Water leaked from dredged material and surface runoff through disturbed ground also contains high solid contents. Muddy water entering irrigation canals will cause sedimentation. Aquatic life in the canal would also be affected by turbid water.	- If dredging is carried out directly onto the water, dredge at intervals to allow suspended materials to resettle before continuing. - Observe water color at 20 m upstream and stop dredging when water color there started to change
<i>Increased Safety risk for the Public</i>	- Place stable barriers along the construction corridor boundary to separate the site with nearby structures - Place warning signs and reflective barriers along the construction area, at dangerous locations and within sensitive receptors - Ensure adequate lighting at
<i>Health and Safety risk to the workers</i> - The health of workers may be affected due to exposure to odour and other contaminants from sludge - Risk of being drown	- Within two weeks before dredging is started, the contractor will coordinate with the local authority to identify good swimmers or those who can dive in the locality, and hire at least one of them at each canal construction site deeper than 3 m and there are workers working on or near the water surface. - Provide and enforce the workers to use masks. - If and when working in the water, protective cloths, rubber boots, gloves and hats must be worn.
<i>Others</i>	- Other relevant measures specified in ECOP or proposed by the contractors as necessary
MATERIAL LOADING AND TRANSPORTATION	
<i>Dust and nuisance, traffic safety risks</i> - Dust or wet materials may be dropped along the transportation route	- Use water-tight tank boats for transporting wet/dam materials - Cover the materials tightly before leaving the construction site - Do no overload material on the trucks
AT FINAL DISPOSAL SITE	
<i>Landslide and soil subsiding risks at final disposal site</i> Landslide and subsiding risk may happen on slopes created at the final disposal site of dredged materials if the slopes created are too high, steep or unstable	- Level the materials after being disposed off - Slopes of the dumps will not be steeper than 45° - Build/create the embankments to protect slopes - Create and maintain drainage at the foot of each dump higher than 2 m

<p><i>Soil and Water Quality Pollution</i></p> <ul style="list-style-type: none"> - The disposal of acid sulfate soil affects the existing soil quality - No risks of subsidence and landslide for residential areas around this area - No impacts on river water quality 	<p>Apply measures that ensure rainwater onto the acid sulfate materials is not mix with the surface runoff from the surrounding to overflow uncontrolled at the site; rainwater will be infiltrated onto the ground on-site. This can be done by the following mitigation measures:</p> <ul style="list-style-type: none"> - Build drainage ditches surrounding the designated disposal area - Use impermeable materials to cover the walls surrounding the materials to isolate it with the surrounding - Other measures proposed by the contractors to meet pollution control targets
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5. Specific Guidance for Dredging

- Identifying the available land for disposing the dredged materials. The plan should also identify the possible lands to be appropriated for the disposal of dredged materials. Public land, land for construction of rural roads, public works, private land, etc. may be used, with an agreement with the project affected households. It should also meet local plans for land use.
- Preparing for a transportation plan. In case, the dredge disposal area is far away from the dredged sites, the DMP shall set out a transportation plan including: (a) methods of transportation (pipeline, barges, hopper barges) and uploading to the disposal area. If trucks are used, indicate proposed route of the transport from the dredged site to the disposal area, (b) time of operation, (c) type of transportation means and proposed measures to reduce the leakage of the dredged materials from the transport trucks, (d) contractors' responsibilities for cleaning the roads and carry out remedial works if necessary, and (e) a communication plan for the nearby communities including contact number for possible complaints.
- Plan for managing the disposal areas including (a) plan for reducing the drainage; (b) construction of the perimeter dykes (c) construction of sub-containment area, if applicable; (d) planned thickness of the dredged materials (typically less than 1.5 meters); (e) any measures to protect groundwater and soils (e.g., installation of PVC membrane).
- Designing the Draining for Disposal lands. As the dredged materials are in the state of mud at first and soil particles are suspended for 24 to 48 hours. All drainage water from disposal land shall be driven to the drains and discharged back to the river. In order to limit the negative impacts of mud (produced by dredging) on the environment as well as the water quality of the canals, the dredged sediment will be transported to a containing area which is appropriately located and properly design with an adequate size. The dredged spoil will be pumped to the disposal land and then overflow to a settlement pond, where turbidity and total suspended solids are settled. After some time, effluent is returned to the river. A typical design of the dike around each disposal may be as follows: Height: 2m, Footing width: 5 m, and Surface width: 1m. The plan should set out a basic layout.
- Monitoring the Disposed Dredged Materials. A plan for monitoring the dredged materials as well as the water quality of effluent would be required. As stated before, intensive

monitoring would be required if the dredged materials contain a higher content of the heavy metals and other harmful materials than the national thresholds.

- In order to mitigate the issue of turbidity during dredging operation, the DMP shall set out dredging equipment and/or techniques suitable to the particular site. On laying dredging machines on a barge, contractors can use a proper mud-stopping net for enclosing the dredging site and keeping back mud on land, not to let it goes back to the canal. If the disposal site for dredge materials is located far away from the dredger, a suction dredger should be used to transfer all the mud and soil in water to the disposal sites. The length of dredging sections should be limited less than 1 km and the dredging should be done one by one.
- As for the sections with acid sulfate soil or potential acid sulfate soil, the following measures should be considered: dredging should be carried out in the rainy season when more fresh water could be available for diluting acidic water; treating acidic water in the disposal areas before returning effluent to the canals; and proper locate and design of the disposal area not to affect the nearby agricultural land.
- At the completion of the contract, carry out an assessment on dredged materials, and determine the use of the dredged materials for activities such as (a) construction (roads and embankments); (b) basis for individual houses; and (c) gardening.

APPENDIX 8: TERMS OF REFERENCE FOR CONSTRUCTION SUPERVISION CONSULTANT (CSC)

1. General

In order to prevent harm and nuisances on local communities, and to minimize the impacts on the environment during the construction of the civil works under the ICRSL project, Environmental Code of Practices (ECOPs) and subproject ESIA have been prepared and should be adhered to by the Contractors and his employees.

The Construction Supervision Consultant (CSC) is to provide professional technical services (“the Services”) to help ensure effective implementation of the ECOP and subproject ESMP.

2. Scope of Services

The general services to be provided by the CSC are to inspect, monitor the construction activities to ensure that mitigation measures adopted in the ECOPs/ESMP are properly implemented and that the negative environmental impacts of the project are minimized.

On behalf of the PPMU, the CSC will conduct the following tasks:

- Conduct regular site inspections;
- Review the status of implementation of environmental protection measures against the EMP and contract documents;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- As needed, review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions. Where necessary, the CSC shall seek and recommend the least environmental impact alternative in consultation with the designer, the Contractor(s), and PPMU;
- Verify the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures; and
- Provide regular feedback audit results to the contractor’s Chief Engineer according to the ECOP and site-specific mitigation measures;
- Instruct the Contractor(s) to take remedial actions within a specified timeframe, and carry out additional monitoring, if required, according to the contractual requirements and procedures in the event of non-compliances or complaints;
- Instruct the Contractor(s) to take actions to reduce impacts and follow the required EMP procedures in case of non-compliance / discrepancies identified;
- Instruct the Contractor(s) to stop activities which generate adverse impacts, and/or when the Contractor(s) fails to implement the ESMP requirements / remedial actions.
- For contracts that Site Environmental Management Plan (SEMP) is required, the CSC shall provide the final review and recommend a clearance of all Site Environmental plans which may affect the environment. These include, but are not limited to dredging areas, borrow pits and disposal sites, worker’s camp plans. The CSC will review and approve the SEMF presented by the Contractors. Where these plans are found not to comply with the ESMP, ESIA or RAP, the CSC shall work with the PPMU and Contractor to establish suitable measures or remediation.
- Addressing Complaints: Complaints will be received by the Contractor’s Site Office from local residents with regard to environmental infractions such as noise, dust, traffic safety,

etc. The Contractor's Chief Engineer or his deputy, and the CSC shall be responsible for processing, addressing or reaching solutions for complaints brought to them. The CSC shall be provided with a copy of these complaints and shall confirm that they are properly addressed by the Contractors in the same manner as incidents identified during site inspections.

- Certification for Monthly Payments: The CSC shall confirm the monthly payments for environmentally related activities implemented by the Contractor.
- Reporting: the CSC shall prepare the following written reports:
 - Bi-weekly report of non-compliance issues
 - Summary monthly report covering key issues and findings from reviewing and supervision activities

At the end of the project, the CSC shall prepare a final report summarizing the key findings from their work, the number of infringements, resolutions, etc. as well as advice and guidance for how such assignments should be conducted in the future.

APPENDIX 9: TERMS OF REFERENCE FOR INDEPENDENT ENVIRONMENTAL MONITORING CONSULTANT

1. General

The independent environmental monitoring consultant (IEMC) is to provide professional technical services (“the Services”) to monitor the compliance of subproject’s activities based on provisions given in the approved environmental and social management plan for the subproject.

2. Scope of service

The major objective of consultant service is to implement monitoring for social, environmental management activities of the subproject. Of which, the consultant will monitor the compliance of subproject’s activities based on provisions given in the approved environmental and social management plan for the subproject.

Monitoring the implementation of environmental and social management plan (ESMP) is to ensure that all civil contractors implement fully the social and environmental mitigation measures identified in the environmental and social impact assessment (ESIA) report for the subproject and ensure that all impacts of subproject on natural environment, social – economic, community are minimized; the environment will be recovered after finishing the subproject. The unavoidable impacts on infrastructures, income and people’s daily life will be compensated satisfyingly. Details as follow:

- Task 1: Support PPMU in preparing information dissemination at construction sites, bidding documents and joining negotiation for civil work contracts during subproject implementation:
 - Assist PPMU to prepare necessary contents for the dissemination of environmental safeguards (ESs) documents during the implementation of subproject;
 - Assist PPMU to incorporate environmental terms into Bidding Documents;
 - Assist PPMU during negotiation of civil work contracts to ensure compliance of environmental safeguard measures during sub-project implementation.
- Task 2: Provide guidance to civil work contractors in preparation of Site Environmental Management Plan (SEMP), review SEMPs prepared by contractors before their submission to PPMU for approval. According to requirements of approved environmental and social management framework (ESMF), civil work contractors must prepare a detailed plan for implementation of environmental terms in the signed contracts, Environmental Codes of Practice (ECOP) and contractor obligations stated in ESMP. EMC shall provide guidance to contractors in preparation of such plans, and review before their submission to PPMU for approval. During its periodical or regular supervision, EMC will evaluate compliance of civil work contractors in Site Environmental Management Plan (SEMP) implementation and recommend necessary remedial actions to PPMU. The monitoring plan will be based on the impacts and mitigation measures identified. The EMC will prepare a checklist to monitor the implementation of the mitigation plan for the construction phase and develop specific recommendations for implementation and control of environmental issues in the operation phase. In addition, the consultant will develop recommendations for environmental monitor and control during operation phase after finishing the project and transferring the subproject works to the subproject operator.
- Task 3: Prepare a form for environmental safeguards compliance monitoring, guide CSC on how to fill in such form which shall be incorporated in reports to PPMU and, upon their

request, be provided to CPO/ IEMC managed by CPO. According to ESMF, daily monitoring of safeguard compliance is assigned to CSC, therefore, EMC should prepare a form for monitoring compliance with ESMP/ECOP, SEMP and guide CSC on how to fill in such form. The information recorded in this manner must be reported to PPMU on a monthly basis and be kept by documentation for independent monitoring by IEMC, internal monitoring by CPO/ CPMU and Supervision Missions by WB.

- Task 4: Support PPMU in preparation of periodical environmental safeguard compliance and monitoring report for submission to CPO, WB/CPO. Four (04) times a years, EMC shall conduct periodical monitoring on contractor's compliance with ESMP/ECOP and SEMP to: (i) evaluate compliance of terms on environmental safeguards stated in civil work contracts; (ii) review safeguards compliance monitoring forms filled by CSC; (iii) monitor environmental quality based on necessary samples and parameters stated in ESIA/ESMP and assess patterns of environmental quality during sub-project implementation, environmental impacts of ongoing subproject activities and effectiveness of mitigation measures; (iv) recommend suitable mitigation measures against adverse impacts of subproject activities and necessary revisions of subproject activities to avoid any long-term, negative impacts on the environment.

On such basis, the consultant will assist PPMU in preparation of quarterly reports on safeguards compliance at subproject level and patterns of environmental quality during subproject implementation, which shall be submitted to CPO; assist PPMU in reporting to CPO/ WB during supervision missions by WB.