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Draft Environmental Management Plan

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September 2003



People's Committee of Can Tho City
Project Management Unit of Urban Upgrading Project

Vietnam Urban Upgrading Project
Can Tho City Sub-Project

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Vietnam Urban Upgrading Project Sanitation
Can Tho City Sub-Project

Preface

The Government of Vietnam has received a grant from World Bank for the implementation of the Vietnam Urban Upgrading Project (VUUP) with the aims to upgrade low-income communities in Haiphong, Ho Chi Minh City, Can Tho and Nam Dinh. The VUUP will provide basic infrastructure and services improvements to low-income communities and a part of critical primary and secondary infrastructure related to the low-income communities.

The Draft Environmental Management Plan for Vietnam Urban Upgrading Project – Can Tho City Sub-Project, Phase I has been prepared based on the information and data available in September 2003, when the Feasibility Studies were not approved, yet. Some of the latest information was available only in Vietnamese. All the information and data will be checked and updated during the preparation of Final Environmental Management Plan Report.

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List of Abbreviations

Organisations

MOC	Ministry of Construction
MOF	Ministry of Finance
MPI	Ministry of Planning and Investment
MONRE	Ministry of Natural Resources and Environment
NEA	National Environmental Agency
MOSTE	Ministry of Science, Technology and Environment
DOSTE	Department of Science, Technology and Environment
MOST	Ministry of Science and Technology
CMS	Consulting Management Services
PMU	Project Management Unit
TUPWS	Transportation and Urban Public Works Service
VUUP	Vietnam Urban Upgrading Project
KfD	German Development Agency
WB, the Bank	The World Bank
FIDIC	Federation Internationale des Ingenieurs-Conseil

Other

BOLUG	Building Ownership and Land Use Certificate
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
CEMP	Community Environmental Management Plan
CUP	Community Upgrading Plan
LIA	Low-income Area
PIP	Project Implementation Plan
RAP	Resettlement Action Plan
TA	Technical Assistance
O&M	Operation and Maintenance
Phuong	ward

Summary

Introduction

The Vietnam Urban Upgrading Project (VUUP) aims to upgrade low-income communities in four cities, namely Ho Chi Minh, Hai Phong, Nam Dinh, and Can Tho. The VUUP will provide basic infrastructure and services improvements (referred to as tertiary infrastructure) to low-income communities already identified in the cities. To ensure that the tertiary infrastructure provided is able to operate effectively and to its optimum, critical primary and secondary infrastructure (referred to as trunk infrastructure) is also to be provided as part of the VUUP.

According to the Terms of Reference for Phase 1 of Vietnam Urban Upgrading Project – Can Tho City Sub-Project the EIA Consultant will prepare Environmental Impact Assessment (EIA) documentation including Environmental Management Plan that corresponds to the requirements of the Government of Vietnam and the World Bank safeguard policies OP 4.01 on Environmental Assessment and OP 4.11 on Physical Cultural Resources where the concerns of impacts on cultural structures are triggered.

Objectives and Principles

The objectives of Can Tho City Sub-Project, as well as the objectives of the Vietnam Urban Upgrading Project in general, are as follows:

- Alleviate poverty in urban areas by improving the living and environmental conditions of the urban poor
- Promote the participatory planning methods for urban upgrading to meet the people's demand
- Use multi-sector approach with communities' consultation in implementation process of upgrading programs.

The most important principle of the project is to active community participation in all stages of preparation, design and implementation processes. The residents, who are living in the project area, will have the right to participate in and benefit from the project as well as contribute to the upgrading works.

Scope of the Project

Scope of the project

An Cu and An Hoi wards were selected to be including to the phase 1 of the project. The proposed Project Components are as follows:

- Project Component No.1: Upgrading tertiary infrastructure and related primary and secondary infrastructure networks, and technical assistance, design, supervision and training
- Project Component No. 2: Construction of the resettlement site
- Project Component No. 3: Tenure security
- Project Component No. 4: Revolving fund for housing improvement

Draft Environmental Management Plan has been prepared for Component 1 and 2.

Project Component 1: Trunk Infrastructure

The scope of proposed Trunk Infrastructure Design according to Inception Report on Consulting Services for Preparation of Primary and Secondary (Trunk) Infrastructure in Can Tho published in September 2003 is presented in the following table. In October after submission of Conceptual Design Options for Road and Embankment Xang Thoi Canal and Lake have been made new calculations for proposed options. The amount of dredged material is on the same level that in the original calculations. Because the decision making process is still ongoing the updated quantities will be presented only in the Final EIA.

Scope of Trunk Infrastructure Design according to the Inception Report

Component	Description	Quantity
WATER DRAINAGE SYSTEM		
D3	Embankment for Xang Thoi Lake and Channel	1.680 m
D7	Dredging for lake, channels and arroyos: a) Xang Thoi Lake and Channel b) Arroyos of Mit Nai and Con	41.650 m ³ 2.750 m ³
BRIDGES		
B1	Xang Thoi Bridge, 7m wide, walkways both sides, 1.5m wide each, 50m long	500 m ²
B2	Xang Thoi Lake Bridge connecting roads round the lake, 4m wide, walkways both sides, 1m wide each, 90m long	540 m ²
B3	Mieu Bridge, 4m wide, 17m long	68 m ²
B6	Chuong Bo Bridge, 4m wide, 17m long	68 m ²
ROADS		
R1	Roads around Xang Thoi Lake and Channel, 4m wide, 1680m long, hot asphalt concrete	1.680 m
R2	Walkways and pavements around the lake, 3m wide each side 1680m long, tiled with cement bricks	1.680 m
R3	Truong Dinh Road, Quarter 2 (from De Tham to Ly Tu Trong), 4m wide, hot asphalt concrete	300 m
ELECTRICITY		
E1	Lighting around the lake and channel (incl. poles, wires, beams, porcelain, mercury fluorescent lamps)	1,68 km
E2	Lighting for Truong Dinh Road, Quarter 2 (from De Tham to Ly Tu Trong)	0,3 km

Project Component 2: Construction of the Resettlement Site

The city has identified and approved a resettlement site in Thoi Nhut hamlet in Anh Binh Commune for resettlement of PAPs from several projects in the city. Part of the site has been assigned to the resettlement requirements of the project, although it is understood that the precise extent of the site to be used for the project may be revised because of existing development on part of assigned area.

Depending on the selection Xang Thoi Lake and Canal improvement 200 - 300 households in Phase 1 will be relocated for the construction execution of the Project. In Option 2 about 100 households have to be resettled from Xang Thoi Lake and Canal area. These households will be resettled in the resettlement area in Thoi Nhut hamlet in An Binh Commune in Can Tho City. The proposed

resettlement area is about 15.5 ha, mainly agriculture land for paddy rice and detached houses with gardens.

It is also proposed to have insitu resettlement site by filling in the Con arroyo and thus creating 2,000 – 2,300 m² of land and possibility of insitu relocation of 40 – 55 households, which is the half of households to be removed from the area.

Location of the Project

To the Phase I include An Cu and An Hoi wards. Proposed resettlement sites are located in Thoi Nhut hamlet in Anh Binh commune and insitu resettlement site on the top of Con arroyo.

Environmental Impacts

Upgrading of tertiary infrastructure will reduce poverty in the low-income areas in Can Tho City by improving infrastructure and basic services and thus providing better environment, scenery and health for the poor people.

Existing environmental conditions fail to achieve the environmental quality standards required by the Government policy and legislation. In order to achieve the long-term benefits, the project is expected to generate short-term adverse impacts, particularly during the construction stage due to the proposed scale of the interventions. However, the majority of adverse construction phase impacts can be mitigated through:

- The incorporation of appropriate contract conditions that define operating procedures to be adopted by contractors
- Maintaining an effective consultation process that ensures effective participation of community (primary stakeholder) level in implementing the Community Environmental Management Plan (CEMP) and Environmental Management Plan (EMP)
- Ensuring the project management framework provides coherent decision making about defined actions in the event of non-compliance

Over 22,000 residents in An Cu and An Hoi wards in Phase 1 can get direct or indirect socio-economic and environmental benefits through provision of public utilities, services and infrastructure.

Potentially adverse environmental impacts are associated predominantly with the construction phase of the proposed project. General construction related impacts would be mitigated through measures defined under the EMP and CEMPs.

The environmental impacts are assessed for components 1 and 2 for design, construction and operation phase.

The most serious environmental impact will be from dredging of the Xang Thoi Lake and Canal and related arroyos. Dredging will cause temporary smell and noise nuisance. Transportation of dredged material will cause inconvenience along the transportation route. Scattering of the construction material and excavated soil around the construction and along the transportation routes cause inconvenience,

unpleasant odour and air pollution. Possible cofferdams and other construction related facilities might cause temporary flooding due to the flowing of sediments into the other drainage and/or blocking the flows of the existing drainage. During dredging, especially when it is done as dry excavation, the surroundings are bad looking.

Construction of infrastructure and houses at large resettlement site will cause temporary, but reasonable long-lasting inconvenience to the surroundings. Especially the amount of traffic will increase remarkably during the whole construction period and the existing road to the proposed site is not wide enough for transportation during construction and operation. Construction will also cause temporary noise problems in the tranquil agriculture area.

Filling and construction of proposed in situ resettlement site on the narrow are on Con arroyo in the middle of residential area will increase a lot of traffic in the area and there will be traffic jams on the narrow alley.

Mitigation Measures

Environmental Management Plan consists of mitigation, monitoring and institutional measures to be taken during design, construction and operation phases to eliminate adverse environmental and social impacts, offset them or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures.

The EMP helps to ensure that the proposed environmental actions in the EIA are in phase with the design and rehabilitation work. After discussing and agreeing with the project design engineers, the recommendations have been translated into a practical and action oriented EMP.

Environmental matters have to be integrated in all the design work and planning of the project. The design of the different project components will be carried out taking into consideration relevant environmental standards and minimising adverse environmental impacts on human and biophysical environment by appropriate planning and design. The designing has to be done by minimising the adverse impacts on environment using as much as possible existing facilities and selecting the location of new facilities in areas where the disturbance to environment, people and existing structures is the smallest. Where possible existing rights-of-way has to be used rather than create new ones.

All construction works including to the project will be implemented following the appropriate standards, specifications and working methods. The Contractor has to implement mitigation measures described in EMP and Contract Documents.

Communities and the concerning companies have responsibility to carry out all operation and maintenance work using proper methods and avoiding noise, odour, litter, dust, and traffic nuisance during the operation. The same health and safety instructions as during the construction phase have to be followed also during operation phase when cleaning of sewers and channel and lake dredging.

Summary of Mitigation Measures

Phase	Main mitigation measures	Responsible organisation
Design	<ul style="list-style-type: none"> - International and Vietnamese design criteria and standards to be used - Drainage and widening of alleys designed so that need for resettlement is minimised - Works designed to implemented during dry season 	Design Consultant Design Consultant
Construction	<ul style="list-style-type: none"> - Minimise dust, odour, litter, noise and traffic emissions by good operation management and site supervision - Appropriate working methods have to be followed - Sites have to be kept clean and safe during and after the work - Safety and health regulations has to be strictly followed - Transportation has to be minimised and routes selected to avoid public nuisance - Transportation during rush hours and night has to be avoided - Tight and proper equipment to transport sediment and garbage has to be used to avoid accidental spills and odour nuisances - Construction sites and time has to be informed to the local people in advance 	Contractor Contractor Contractor Contractor Contractor Contractor PMU
O&M	<ul style="list-style-type: none"> - Follow Project Operations Manual, CUPs, CEMPs and EMP - Minimise dust, odour, litter, noise and traffic emissions by good operation and maintenance supervision - Appropriate working methods have to be followed - Immediate preparation of breakages 	PMU PMU PMU Communities

Environmental Monitoring

PMU coordinates with various local departments and sectors and community work teams to technically, socially and environmentally monitor and supervise the Project during the construction, operation and maintenance of the Works.

Environmental Monitoring during Construction

Upgrading Activities	What to monitor	How often	How	Responsibility	Mitigation measures
Water supply	Excavated soil	Every day	Observation	Community work team	Covering vehicle trunks
	Dust	Every day	(ditto)	(ditto)	Watering in front of houses
Roads	Excavated soil, materials	Every day	(ditto)	(ditto)	Covering vehicle trunks
	Dust	Every day	(ditto)	(ditto)	Watering in front of houses
Drainage	Excavated soil	Every day	(ditto)	(ditto)	Covering vehicle trunks
	Dust	Every day	(ditto)	(ditto)	Watering in front of houses
Dredging	Sludge handling	Every day	(ditto)	(ditto)	Using specific vehicles
	Sludge transfer site	Every week	Inspection	URENCO	Sludge water drainage system
	District officer	Every week	Inspection	URENCO	

Environmental Monitoring during Operation

Upgrading Activities	What to monitor	How often	How	Responsibility
Water supply	Quality	Every day	Observation	Households
	Pressure, leakage	Every day	Observation	Households
Drainage	Sediment	Every 6 months	Checking	Community leader
	Clogging	Weekly	Observation	Community leader
Solid waste	Condition around transfer site	Every day	Observation	Households
	Transport	Every 2 days	Observation	Community leader
	Disposal site	Year	Checking	URENCO
Air quality	Odour	Every day	Observation	Households
	Smoke	Every day	Observation	Households
	Dust	Every 3 months	Measuring	DOSTE
	Noise	Every 3 months	Measuring	DOSTE

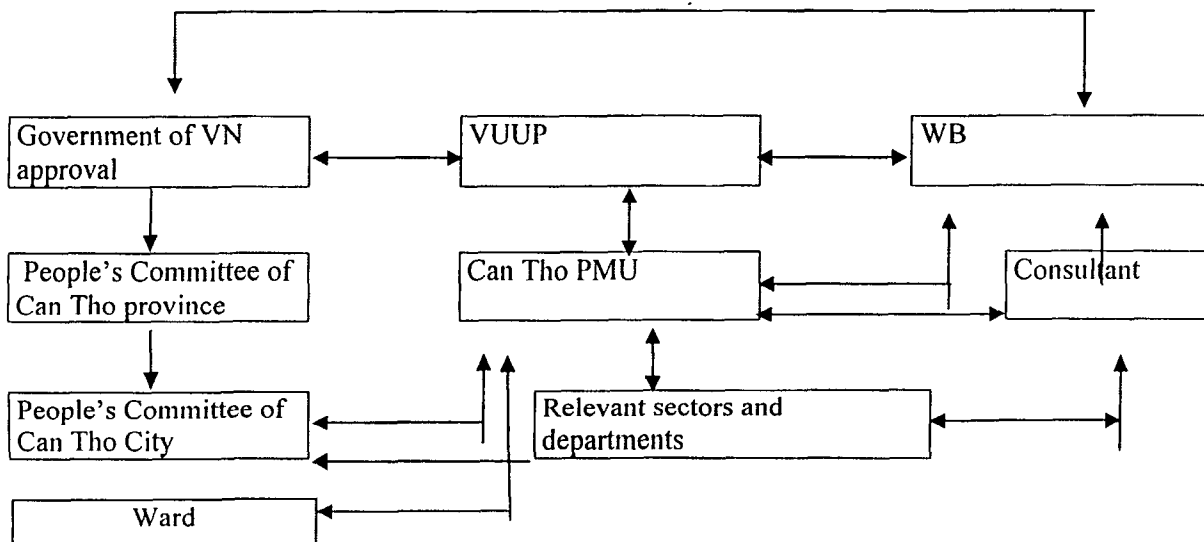
Monitoring of water and sediment quality the Xang Thoi Lake and Canal should be agreed with the PMU and DONRE. It is recommended that the same water and sediment sampling points and parameters should be used as in the survey done in September 2003 to follow-up the impacts of the project.

More detailed sampling programme will be presented in the Final Environmental Impact Assessment report.

Implementation organization

The People’s Committee of Can Tho City is the Investor of Can Tho Urban Upgrading Project, therefore the World Bank will work directly with the People’s Committee.

The People’s Committee of Can Tho City has established PMU under the direct control of the City People’s Committee for managing and implementing the Project.



Relationship and responsibilities of relevant departments and agencies

Because the project is multi-sectoral PMU should maintain close ties with various sectors and departments in the Province, the City and ministries:

- The People's Committee of the Province is in charge of approval of resettlement site planning, phased projects, project components, technical design and total cost estimate, bid invitation packages and bid results
- Department of Construction is responsible for evaluating resettlement site planning and submission to the PC of the Province for approval
- Department of Planning and Investment is responsible for evaluating technical support reports; evaluating project components; evaluating bid invitation packages; evaluating bid selection results for submission to the PC of the province for approval. Simultaneously the Department is also responsible for allotment of annual capital plan for the project implementation in accordance with the schedule.
- Cadastral Department is responsible for making procedures for land acquisition and hand over to PMU for execution of the resettlement quarter in Thoi Nhat hamlet, An Binh Commune and other work related to compensation and site clearance within the project coverage
- Department of Industry is responsible for evaluating the technical design package of the low voltage power and lighting systems of the primary, secondary and tertiary infrastructure for submission to the PC of the Province for approval.
- Cadastral Board of Can Tho City and the Board of Construction, Housing and Land are responsible for BOLUCs for households within the affected zone of the Project.
- Can Tho Power Company is responsible for co-ordination to assure the connection of the low voltage network and the stations for the power system of the Project
- Can Tho Water Supply Company is responsible for co-ordination to assure the connection of the water supply system between the water treatment plant and the required network of the Project
- Urban Works Company is responsible for organization and co-ordination for solid waste collection and handling for upgrading quarters of the Project
- Health Care Centre of Can Tho City; Board of Education and Board of Market Management of Can Tho City are responsible for co-ordinating with PMU for upgrading social infrastructure works managed by the sectors
- PCs at ward level are responsible for closely co-ordinating with PMU in CUPs, plans for environmental impact assessment in upgrading quarters of the Project as well as in resettlement site
- Department of Transportation is responsible for assessing the projects affecting urban infrastructure such as access roads, water supply and drainage for submission to the Provincial PC for approval
- Department of Natural Resources and Environment is responsible for assessing the Report on environmental impact assessment of the Project for submission to the Provincial PC for approval.

The Government has authorized the PC of Can Tho Province directly to approve the project components to shorten the time for procedure dealing for capital construction as well as for the overall time schedule of the Project.

Throughout the Project implementation, the World Bank will guide the project with the frequent supervision. The representative office of the World Bank in Hanoi will co-ordinate activities of the Project, provide comments and support in implementation methods as well as financial procedures for the timely and effective implementation of the Project.

Environmental Training

During the preparation of the Draft Environmental Management Plan the CEMP was not available, yet, and therefore only preliminary proposals for environmental training was available.

Environment education and community awareness enhancement program (for habitants) and environment management capacity building (for management officials) is including the following items:

- Improve people' awareness on environmental protection to realize that it is necessary to protect their own living and working environment, and to consider the environment as the asset to be preserved and protected
- Use mass media and organize training workshops for management officials and habitants to acquire basic contents of the laws on environment and the necessity of strict monitoring
- Educate the awareness on saving, rational and effective use of the natural resources such as fuel, energy, water and land etc.
- Educate the awareness on environmental protection and hygiene. Hygiene and waste management programs in the quarters should be frequently conducted.
- Take an active part in implementation of environment protection plans according to general regulations and instructions of Can Tho City authorities. Educate and encourage habitants in the quarters to follow the regulations on fire and explosion protection. Health examination should be periodically carried out.
- Observe the laws on environment and report all environmental incidents to relevant authorities.

The more detailed environmental training plan will be presented in the Final Environmental Management Plan.

1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Background of the Project

Vietnam's cities have rapid growing populations, and infrastructure and utility service investments have lagged far behind demand. Low-income areas have developed, and are continuing to develop, in an ad-hoc unplanned manner with little infrastructure and services. This creates environmental and health hazards for their residents and the city at large. New, innovative and low cost approaches are thus required to address Vietnam's growing urbanization challenges.

Realizing this, the Government of Vietnam has requested donor assistance to prepare a national program to upgrade low-income communities. Preparatory studies funded through the Cities Alliance have been completed to help develop a National Urban Upgrading Program. The Ministry of Planning and Investment has requested the World Bank to support a Vietnam Urban Upgrading Project (VUUP) as the first major project in the national program. The VUUP aims to upgrade low-income communities in four cities, namely Ho Chi Minh, Hai Phong, Nam Dinh, and Can Tho (Drawing 1). The VUUP will provide basic infrastructure and services improvements (referred to hereafter as tertiary infrastructure) to low-income communities already identified in the cities. To ensure that the tertiary infrastructure provided is able to operate effectively and to its optimum, critical primary and secondary infrastructure (referred to hereafter as trunk infrastructure) is also to be provided as part of the VUUP.

It is anticipated that a number of families will have to be unavoidably resettled, and therefore social housing and/or basic serviced sites for housing will be provided (referred to hereafter as housing developments). The combination of investment for tertiary and trunk infrastructure, and housing developments in each city will be referred to hereafter as the city's sub-project. In each city, the sub-project is divided into two or three phases, each of which will be implemented over a 2-3 year period. Phase 1 will be prepared before the project is presented to the World Bank's Board and Phases 2 and 3 will be prepared during project implementation.

1.2 Environmental Management Plan of the Project

According to the Terms of Reference for Phase 1 of Vietnam Urban Upgrading Project – Can Tho City Sub-Project the EIA Consultant will prepare Environmental Impact Assessment (EIA) documentation that corresponds to the requirements of the Government of Vietnam and the World Bank safeguard policies OP 4.01 on Environmental Assessment and Annex C Environmental Management Plan and OP 4.11 on Physical Cultural Resources where the concerns of impacts on cultural structures are triggered. The EIA documentation should also give broad picture on environmental condition in the project areas of all the three phases and specify guidance to the preparation of EIA documentations for phases 2 and 3.

The scope of the environmental documentation consists of six main tasks as follows:

1. Review and amend as necessary Community Environmental Management plans (CEMPs) for Community Upgrading Plans (CUPs) for the tertiary infrastructure of Phase 1
2. Site-specific EIAs for trunk infrastructure and housing developments including
 - Description of the components of the Trunk Infrastructure and Housing Development
 - Description of the environment
 - Legislative and regulatory considerations
 - Determination of potential impacts of the proposed components
 - Analysis of alternatives to the proposed Trunk Infrastructure and Housing Development as a whole and its components
 - Develop Environmental Management plans for Trunk Infrastructure and Housing Developments (EMPs)
3. Environmental section of the Environmental and Social Safeguards Framework (ESSF) of the Project Operations Manual
4. Public consultation and public disclosure
5. Reporting
6. Project Environmental Management Plan

Draft EMP has been prepared in September 2003 when the Trunk Infrastructure Consultant has just started their work. Therefore especially the information concerning the content, impacts, mitigation measures and cost estimates of the project are only preliminary and will be revised for the final report.

The Draft Environmental Management Plan is based on the following:

- Vietnam Urban Upgrading Project (VUUP) Terms of Reference for the Preparation of Environmental Impact Assessment (EIA) – Phase 1, May 2003
- The World Bank OP 4.01 on Environmental Assessment, January 1999
- The World Bank OP 4.11 on Physical Cultural Resources
- Guidelines for Procurement under IBRD and IDA credits. The World Bank. January 1995, revised January 1996, August 1996, September 1997 and January 1999
- Standard Bidding Documents for the Procurement of Works. The World Bank
- Guide to the Use of FIDIC. Conditions of Contract for Works of Civil Engineering Construction. Fourth Edition 1989
- Vietnam construction regulation and standard, Volume I, MOC
- Law on Environmental Protection, December 1993
- Decree 175/CP Government Decree on providing Guidance for the Implementation of the Law on Environmental Protection, October 1994
- Vietnamese Environmental Standards, 1995, 1998, 1999, 2000, 2001, MoSTE
- Vietnam Urban Upgrading Project (VUUP) Can Tho Sub-Project Investment Consultancy for Development and Construction Corporation (Thikeco), October 2002
 - Pre-Feasibility Study, Vietnam Urban Upgrading Project – Can Tho City Sub-Project

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- Feasibility Study Component project No 1 Investment in Tertiary Infrastructure, Related Primary and Secondary Infrastructure Networks upgrading and Technical Assistance, Design, Supervision and Training for Phase 1 (Low-income community quarters in An Cu and An Hoi wards), Investment Consultancy for Development and Construction Corporation (Thikeco), July 2003
 - Report on Socio-economic Survey Results in Wards of An Cu and An Hoi in Can Tho
 - Draft CUPs for An Cu (in Vietnamese) and An Hoi (in English) wards
 - Conceptual Design Options for Road and Embankment Xang Thoi Canal and Lake (Draft); Black and Veatch & Nagecco, September 2003
 - Draft Feasibility Study on Resettlement Site Construction at Thoi Nhut Hamlet in An Binh Ward, October 2003
 - Site visits
 - Discussions with DONRE, VUUP Can Tho PMU and Trunk Infrastructure consulting team
 - Review of documents and project overview

1.3 Objectives and principles of the Sub-Project

The objectives of the Can Tho City sub-project include:

- To alleviate poverty in urban areas by improving the living and environmental conditions of the urban poor
- To promote participatory planning methods for urban upgrading that are more responsive to people's demands.

The Project is implemented based on the following principle:

- The Project is implemented with the active participation of community in the project preparation and performance process. All residents living in the Project zones have rights to participate and benefit from Project regardless of sex and the availability of the official registrations. Communities are encouraged to contribute finance for the Project. Local mass organizations (NGOs) are encouraged to participate to facilitate the community, especially women's involvement in the project preparation and implementation
- Resettlement and land acquisition will be minimized as much as possible to avoid the break of social structure
- The Project is anticipated to be implemented in a synchronous manner with coordination of various sectors such as water supply, water drainage, transportation, etc. for the effectiveness of the Project
- The Project is implemented based on the suitable technical standards to meet the requirements of habitants so that the number of beneficiaries is the biggest and the investment cost suitable with the financial capacity of various levels' budgets and the habitants

1.4 Location of the Project

To the Phase I include An Cu and An Hoi wards. Location of the concerning areas are presented in Drawings 2 – 4. Location of the resettlement site in Thoi Nhut hamlet in Anh Binh commune is presented in Drawing 5 and proposed insitu resettlement site on the top of Con arroyo is presented in Drawing 6.

1.5 Scope of the Sub-Project

1.5.1 General

The Prime Minister approved the Pre-Feasibility Study on Urban Upgrading – Can Tho Sub-Project by Letter No. 729/CP-CN dated on May 30, 2003. Based on that Can Tho province People's Committee will approve Project Components of each Phase of the Project.

In the meeting between the World Bank and MPI on May 9, 2003 it was agreed that to the Project would include the following six items:

- Upgrading tertiary infrastructure
- Upgrading primary and secondary infrastructure networks as related
- Housing for the poor
- Tenure security
- Revolving credit for housing improvement
- Technical assistance, design, supervision and training

For Phase 1, the proposed Project Components to be prepared and submitted to the provincial PC for approval include:

- Project Component No.1: Upgrading tertiary infrastructure including
 - Upgrading related primary and secondary infrastructure networks
 - Technical assistance, design, supervision and training
- Project Component No. 2: Construction of the resettlement site
- Project Component No. 3: Tenure security
- Project Component No. 4: Revolving fund for housing improvement

Draft Environmental Management Plan has been prepared for Component 1 and 2.

1.5.2 Project Component 1: Trunk Infrastructure

The scope of proposed Trunk Infrastructure Design according to Inception Report on Consulting Services for Preparation of Primary and Secondary (Trunk) Infrastructure in Can Tho published in September 2003 is presented in Table 1-1.

In October after submission of Conceptual Design Options for Road and Embankment Xang Thoi Canal and Lake have been made new calculations for proposed options. The amount of dredged material is on the same level that in the original calculations. Because the decision making process is still ongoing the updated quantities will be presented only in the Final EMP.

Table 1-1 Scope of Trunk Infrastructure Design

Component	Description	Quantity
WATER DRAINAGE SYSTEM		
D3	Embankment for Xang Thoi Lake and Channel	1.680 m
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B1	Xang Thoi Bridge, 7m wide, walkways both sides, 1.5m wide each, 50m long	500 m ²
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R1	Roads around Xang Thoi Lake and Channel, 4m wide, 1680m long, hot asphalt concrete	1.680 m
R2	Walkways and pavements around the lake, 3m wide each side 1680m long, tiled with cement bricks	1.680 m
R3	Truong Dinh Road, Quarter 2 (from De Tham to Ly Tu Trong), 4m wide, hot asphalt concrete	300 m
ELECTRICITY		
E1	Lighting around the lake and channel (incl. poles, wires, beams, porcelain, mercury fluorescent lamps)	1,68 km
E2	Lighting for Truong Dinh Road, Quarter 2 (from De Tham to Ly Tu Trong)	0,3 km

1.5.3 Project Component 2: Construction of the Resettlement Site

The city has identified and approved a resettlement site in Thoi Nhut hamlet in Anh Binh Commune for resettlement of PAPs from several projects in the city. Part of the site has been assigned to the resettlement requirements of the project, although it is understood that the precise extent of the site to be used for the project may be revised because of existing development on part of assigned area.

The details of the resettlement site are presented in Table 1-2 and Drawing 11. More detailed information will be given in the Feasibility Study on Resettlement Site and Resettlement Action Plan report.

Depending on the selection Xang Thoi Lake and Canal improvement 200 - 300 households in Phase 1 will be relocated for the construction execution of the Project. In Option 2 about 100 households have to be resettled from Xang Thoi Lake and Canal area. These households will be resettled in the resettlement area in Thoi Nhut hamlet in An Binh Commune in Can Tho City. The proposed resettlement area is about 15.5 ha, mainly agriculture land for paddy rice and detached houses with gardens. This is an area with numerous channels and arroyos such as Tu Ho, and Ba Bo arroyos, etc. In general, the land area is formed from the sediment (silt) of Hau River. At present, there is no water supply network provided by Can Tho Water Supply Company. Residents use water

mainly from rivers and channels and deep wells and discharge water mainly to Tu Ho arroyo. Roads are mainly pathways, temporary bridges with wooden plates, concrete grids just for carts and pedestrians.

1.6 Present Environmental Setting

The rapid growth rate of Can Tho City and urbanisation is giving pressure to urban environment. Due to the development and increase of population the pollution is increasing. The biggest problems are air and noise pollution due to the increased traffic; water pollution and water-related diseases due to lack of proper wastewater treatment and general uncleanliness due to the insufficient solid waste collection.

Pollution level is increasing all the time due to the increasing business and domestic activities and lack of wastewater treatment. Due to the many years of accumulation solid waste and organic waste the water and sediment quality of the Xang Thoi Lake and Canal has degraded and it not possible to use these water for domestic purpose any more. The lakes, canals and arroyos are becoming shallower for the same reason and there is not storage capacity during rainy season.

Households and industry along rivers and channels with low income and low education level discharge wastes directly to channels. Most channels and arroyos are encroached by many residents, which results the blockade of water flow.

2 ENVIRONMENTAL LEGISLATION

2.1 Environmental Management

Until now the Ministry of Science, Technology and Environment (MOSTE) has been the top decision-making body with overall responsibility within the environmental sector. Besides the Ministry, there have been several other agencies involved in the management and protection of the environment. MOSTE's main role has been to assist the Government in the strategies and policy-planning issues related to science, technology and environment.

Within the Ministry, the National Environmental Agency (NEA) has been the environmental arm, whose main task is to act as co-ordinating body for other Ministries with environmental responsibilities. It is also charged with developing legislation, regulations and guidelines, programs, control and monitoring systems to enforce the production of the environment throughout the country.

National Assembly has approved the government's proposal to create the Ministry for Natural Resources and Environment (MONRE) by decision 02/2002/QH11 on August 5, 2002. Decree No 86/2002/ND-CP on November 5, 2002 provides in general functions, tasks, powers and organisation structure of the ministry and ministerial agencies. Decree No 91/2002/ND-CP on the functions, tasks, powers and organisational structure of the Ministry of Natural Resources and Environment has been given on November 11, 2002. The new ministry will co-operate with the General Department of Land Administration, the General Hydro-Meteorology Department and environmental offices that now operate under the Ministry of Science, Technology and Environment.

MONRE is a government body to exercise the state function of management over the land, water resources, minerals, environment, meteorology, hydrogeography, measuring and mapping in the national scope; exercise the governance over the public services and represent the owner of state capital in enterprises using state budgets relating to natural resources of land, water, minerals, environment, meteorology, hydrogeography, measuring and mapping specified by laws.

Concerning environment the tasks and authorities are as follows:

- Direct and supervise the implementation of the regulations and measures for the protection of the environment, the programs and projects on the prevention of combat and overcoming the degradation and pollution, environmental break-down as assigned by the government
- Uniformly manage the national environmental monitoring system; summarise and treat data resulted from environmental monitoring and regularly assess the environment; forecast the environmental changes
- Appraise environmental impact assessment reports of the projects and business, and production units; regulate environmental standards and uniformly manage the licensing, restoring the environmental standards satisfied certificates according to the regulations of the laws

- Mobilise the donor resources, receive the investment capital from the State to support programmes, projects, activities and tasks to protect the environment and manage the utilization of Vietnam Environmental Protection Fund.

2.2 Environmental Law and Decree

In Vietnam, the basic national environmental policy is based on the Law on Organisation of the Government (September 30, 1992), the Law on Environmental Protection (December 27, 1993) and the Decree No. 175-CP (October 18, 1994).

The National Assembly ratified the Law on Environmental Protection on December 27, 1993, and the decree has been issued on October 18, 1994. In the Law, there are very clear articles to prevent environmental pollution in general, and also articles concerning wastewater management. The Government Decree provides the guidance for implementation of the law on environmental protection.

The general provisions of the law are described in Chapter 1, which defines the meaning of the terms (Law on Environmental Protection, 1993).

Article 2 defines waste, pollutants and environmental pollution as follows:

“Wastes mean substances discharged from daily life, production processes or other activities. Wastes may be in a solid, gaseous, liquid or other forms. Pollutants mean factors that render the environment noxious. Environmental pollution means alteration in the properties of the environment, violating environmental standards”.

2.3 Laws and Regulations on Environmental Impact Assessment

The Articles 17 and 18 describe the EIA-procedure. According to the Law on Environmental Protection, Article 18:

Organisations, individuals when constructing, renovating production areas, population centres or economic, scientific, technical, health, cultural, social, security and defence facilities, owners of foreign investment or joint venture projects, and owners of other socio-economic development projects, must submit EIA reports to the State Management Agency for environmental protection for appraisal. The result of the appraisal of EIA reports shall constitute one of the bases for competent authorities to approve the projects or authorise their implementation. The Government shall stipulate in detail the formats for the preparation and appraisal of EIA reports and shall issue specific regulations with regard to special security and defence establishments mentioned in Article 17 and in this article. The National Assembly shall consider and make decision on projects with major environmental impacts. The Standing Committee of the National Assembly shall determine a schedule of such types of projects.

In October 18, 1994, the Government of Vietnam issued a decree providing Guidance for the Implementation of the Law on Environmental Protection, which includes assessment of environmental impacts. This decree, together with other documents needed for an EIA, was published in 1995 by MOSTE as a separate guideline document.

Until now MOSTE has been the responsible authority of the approval of Environmental Impact Assessments, but according to the Decree 91/2002/ND-CP under MONRE has been established among many other departments Environmental Impact Assessment and Appraisal Department. The EIA can, however, be appraised by the local DONRE based on their knowledge of local conditions and further be delivered to PC for approval, if delegated by MONRE.

2.4 Environmental Standards and Regulations

The Government shall stipulate the nomenclature of environmental standards and delegate the authority at different levels for promulgating and supervising the implementation of such standards.

MOSTE has published 1995, 1998, 1999, 2000 and 2001 Vietnamese Environmental Standards, and standardisation work is in progress. From now on MONRE will continue the work. In cases, where the applicable Vietnamese standard is inadequate, not regulated or applicable, project agencies must obtain MONREs approval for the use of equivalent standards of the countries that have provided the technology and equipment to Vietnam, or apply equivalent standard from a third country. At least the following environmental standards are related to water and wastewater quality (Table 2-1). Besides water related standards there are several standards concerning air quality, noise and soil quality.

Table 2-1 Vietnamese environmental standards (MoSTE 1995, 1998, 1999, 2000, 2001)

Number of standard	Name of standard
TCVN 5998-1995	Guidance on sampling on marine waters (ISO 5667-9:1992)
TCVN 5999-1995	Guidance on sampling of wastewater (ISO 5667-10:1992)
TCVN 5524-1995	General requirements for protecting surface water against pollution
TCVN 5525-1995	General requirements for protection of underground water
TCVN 5942-1995	Surface water quality standards for raw water supply and general use
TCVN 5944-1995	Groundwater quality standard
TCVN 6772:2000	Water quality – Domestic wastewater standards
TCVN 6774:2000	Water quality – Fresh-water quality guidelines for: protection of aquatic sites
TCVN 6982:2001	Water quality – Standards for industrial effluent discharged into rivers using for water sports and recreation
TCVN 6983:2001	Water quality – Standards for industrial effluent discharged into lakes using for water sports and recreation
TCVN 6984:2001	Water quality – Standards for industrial effluents discharged into rivers using for protection of aquatic life
TCVN 6985:2001	Water quality – Standards for industrial effluent discharged into lakes using for protection of aquatic life
TCVN 5937-1995, 5940-1995	Monitoring system for the air quality
TCVN 5948-1999	Allowed limitation values for road motor vehicle noise
TCVN 5949-1998	Allowed limitation values for noise in public and residential areas
TCVN 6962:2001	Vibration and shock – Vibration emitted by construction works and factories – Maximum permitted levels in the environment of public and residential areas

2.5 Hygienic Regulations

The Council of Ministers promulgated the Hygienic Regulations and Administrative Penalty in Health Service in July 1991 (No: 23/HDBT). These are based on the Organisation Law and the People Health Protection Law. There are directive principles for raising awareness among the public; preventive measures, environmental improvement and cleansing; assurance of occupational health and food hygiene.

2.6 World Bank Guidelines

The environmental impact assessment study for the sanitation project was designed to evaluate its status with respect to all applicable World Bank environmental and operational policies and guidelines.

During the EA process for this project, a review of World Bank environmental and operational policies was carried out with respect to their relevance to this project. The policies directly relevant to this project are Environmental Assessment (OP 4.01), Cultural Property (OP 4.11) and Involuntary Resettlement (OP 4.30). The specific World Bank guidelines that were identified as being applicable to this project are Environmental Assessment Sourcebook, Volume I and II (1991) and Pollution Prevention and Abatement Handbook 1997.

For all Category A projects proposed for IBRD or IDA financing, during the EA process, the borrower consults project-affected groups and local nongovernmental organisations (NGOs) about the project's environmental aspects and takes their views into account. For Category A projects, the borrower consults these groups at least twice: shortly after environmental screening and before the terms of reference for the EA is finalised; and once the draft EA report is prepared.

For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category A projects for IBRD or IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes draft EA report available at a public place accessible to project-affected groups and local NGOs.

Once the borrower officially transmits the Category A EA Report to the Bank, the Bank distributes the summary (in English) to the executive directors (EDs) and makes the report available through its InfoShop. If the borrower objects to the Bank's releasing an EA report through its InfoShop, Bank staff (a) do not continue processing an IDA project or (b) for IBRD project, submit the issue of further processing to the EDs.

According to the World Bank Operational Policy 4.01 – Annex C Environmental Management Plan:

1. A project's environmental management plan (EMP) consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures. Management plans are essential elements of EA reports for Category A projects; for many Category B projects, the EA may result in a management plan only. To prepare a management plan, the borrower and its EA design team (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements. More specifically, the EMP includes the following components

Mitigation

2. The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP

(a) identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement);

(b) describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;

(c) estimates any potential environmental impacts of these measures; and

(d) provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

Monitoring

3. Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the EMP. Specifically, the monitoring section of the EMP provides

(a) specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of

measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and

- (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

Capacity Development and Training

4. To support timely and effective implementation of environmental project components and mitigation measures, the EMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the agency and ministry level. If necessary, the EMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of EA recommendations. Specifically, the EMP provides a specific description of institutional arrangements—who is responsible for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Implementation Schedule and Cost Estimates

5. For all three aspects (mitigation, monitoring, and capacity development), the EMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.

Integration of EMP with Project

6. The borrower's decision to proceed with a project, and the Bank's decision to support it, are predicated in part on the expectation that the EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.

3 ENVIRONMENTAL IMPACTS

3.1 General

Upgrading of tertiary infrastructure will reduce poverty in the low-income areas in Can Tho City by improving infrastructure and basic services and thus providing better environment, scenery and health for the poor people.

Existing environmental conditions fail to achieve the environmental quality standards required by the Government policy and legislation. In order to achieve the long-term benefits, the project is expected to generate short-term adverse impacts, particularly during the construction stage due to the proposed scale of the interventions. However, the majority of adverse construction phase impacts can be mitigated through:

- The incorporation of appropriate contract conditions that define operating procedures to be adopted by contractors
- Maintaining an effective consultation process that ensures effective participation of community (primary stakeholder) level in implementing the Community Environmental Management Plan (CEMP) and Environmental Management Plan (EMP)
- Ensuring the project management framework provides coherent decision making about defined actions in the event of non-compliance

Over 22,000 residents in An Cu and An Hoi wards in Phase I can get direct or indirect socio-economic and environmental benefits through provision of public utilities, services and infrastructure.

Potentially adverse environmental impacts are associated predominantly with the construction phase of the proposed project. General construction related impacts would be mitigated through measures defined under the EMP and CEMPs.

Environmental impact matrixes for each component are presented in Annex I in Tables I-1 – I-5.

3.2 Component 1: Tertiary Infrastructure

3.2.1 Design Phase

Design criteria adopted for upgrading tertiary infrastructure will be achieved through extended consultation with residents and community groups to achieve all the interventions proposed aim to clear social, economic and environmental benefits.

Special attention has to be paid to the design of dredging of the Xang Thoi Lake and Canal and related arroyos. There are no endangered animals or plants and works can be done as dry excavation. According to the preliminary sediment quality data no treatment is needed and the dredged material can be used for filling material.

The resettlement around the Xang Thoi Lake and Canal will cause the most serious social impacts. It is estimated that about 100 households should be relocated, if the option 2 will be implemented. The resettlement procedures and site clearance has to be designed and informed to the project affected people clearly and well in advance.

3.2.2 Construction Phase

During the upgrading and construction of drainage, bridges, roads and street lighting there will be various adverse impacts on the environment at different levels. Construction will cause short-term air quality and noise pollution. The means of transport, construction equipments and manpower will be in the continuous work during the whole construction process. These will cause inconvenience to people and pollution risk to environment.

Site clearance for rehabilitation of Xang Thoi Lake and Canal and upgrading of roads will have direct impact on residents' lives. About 100 households will be relocated and about 180 households are partly affected due to the rehabilitation of the Xang Thoi Lake and Canal. Along the alleys to be upgraded houses, yards, toilets and kitchens of most of the households shall be partly demolished. However, the length of the front yard in each household is nearly 1.5m to 3m, so the demolition doesn't affect to the structures of houses. Even the partly demolition disturb the life and daily activities of habitants.

The most serious environmental impact will be from dredging of the Xang Thoi Lake and Canal and related arroyos. Dredging will cause temporary smell and noise nuisance. Transportation of dredged material will cause inconvenience along the transportation route. Scattering of the construction material and excavated soil around the construction and along the transportation routes cause inconvenience, unpleasant odour and air pollution. Possible cofferdams and other construction related facilities might cause temporary flooding due to the flowing of sediments into the other drainage and/or blocking the flows of the existing drainage. During dredging, especially when it is done as dry excavation, the surroundings are bad looking.

Excavating and levelling, material and waste handling, mobilisation of machines, equipment and workers during work execution period also causes many adverse impacts. Transportation means will cause pollution such as noise, vibration, fume, dust, and oil and if there are no tight measures of management, many accidents may occur. Material mobilisation may result in traffic jam and low hygiene conditions in some areas if mitigation measures are not followed.

The gathering of large number of manpower for construction could cause some impacts on the life and surrounding environment at the construction sites. In already densely populated areas this would increase traffic problems, chaotic security and generation of new type of wastes especially at the sites where the workers are concentrated.

During the construction there will be impacts on the social life and quality of life such as interruption of business, traffic jam, loss of children's playground in alleys, labour accidents, effects to daily activities due to the house demolition or repair and suspension of water supply, drainage and power system. The reaction of habitants to upgrading and

rehabilitation work should be taken into consideration. There might be negative reactions of habitants if there is information shortage, for example people refuse to move or delay the relocation.

3.2.3 Operation Phase

The implementation of CUP prepared for the LIAs will give clear socio-economic and environmental benefits to residents through the provision of improved public utilities and services and approaching improved conveniences.

Dredging the lake and canal and construction of embankment will help the water flow and improve the air and water quality and create possibility to aquatic life in the lake.

Construction of interceptor sewers around the Xang Thoi Lake and Canal will remarkably help to keep the rehabilitated lake and canal in good condition.

Improved roads and bridges enable increase of traffic thus increasing air pollution and risks of traffic accidents.

The improvement of the street lighting along the alleys will improve the safety of especially women and children living in the area. The social evils and traffic accidents will be decreased.

The upgrading of roads, water and drainage systems will help mitigate environment pollution. When living conditions are getting better, the residents are eager to renovate and upgrade their houses.

3.3 Component 2: Resettlement Site

3.3.1 Design Phase

Selection the location of needed resettlement site is always complicated, because in the densely populated areas there are is no vacant and uninhabited area available. Therefore location of resettlement site is always a compromise and usually causes an additional need of resettlement of the people who live in the proposed area. Land use and existing activities in the surrounding areas have to be considered, too.

In the design has to be paid special attention to the existing and planned natural and man-made structures and facilities and utilize them as much as possible. The entire necessary infrastructure has to be designed according to the relevant regulations and standards.

The proposed resettlement at Thoi Nhut hamlet in An Binh commune is for the time being agriculture and living area and there will be changes in land use and scenery. The design and location of facilities should be adjusted to the existing scenery. The area is located next to other resettlement site.

Infrastructure and access to the proposed in situ resettlement site on the top of the to be filled Con arroyo has to be designed. Special attention has to be paid to survey and design the foundation works to avoid possible soil subsidence. According to the calculations filling of the Con arroyo does not have impact on hydraulic capacity of the drainage system.

3.3.2 Construction Phase

Construction of infrastructure and houses at large resettlement site will cause temporary, but reasonable long-lasting inconvenience to the surroundings. Especially the amount of traffic will increase remarkably during the whole construction period and the existing road to the proposed site is not wide enough for transportation during construction and operation. Construction will also cause temporary noise problems in the tranquil agriculture area.

Large construction works needs a big number of workers, which might cause temporary inconvenience and decrease of security in the area. On the other hand to provide different kind of services to the workers increase the possibility for small business i.e. food-stalls, cafes etc.

Filling and construction of proposed in situ resettlement site on the narrow are on Con arroyo in the middle of residential area will increase a lot of traffic in the area. There will be traffic jams because the alleys are narrow.

3.3.3 Operation Phase

During the operation the resettlement site causes the same type of impacts than any other living area. However, impact of wastewater is smaller than normally because there is wastewater treatment plant in the area.

High density of population, construction and living activities of residents in resettlement site will affect originally tranquil agricultural area. New and unfamiliar living environment might cause social problems especially for low-income households, because they need more support from neighbours and communities than wealthier households. Children have to go to new schools and if children go to school in resettlement area, they might have problems with new teachers and classmates. If the resettlement areas are far from schools, parents have to spend plenty of time to escort their children and this will affect their work.

The relocation will also cause some troubles in administrative transactions for habitants. In the old and familiar places, though being temporary residents, application for certification of background i.e. for job application, marriage registration, etc. was easy, but in new places, it takes time for people to learn to know local authorities. Centralized resettlement areas may cause "overload" to local authorities regarding to administrative management and social order. A resettlement area is also a new concern for its local authorities as most of resettled households are poor, with little capacity of contributing money for local infrastructure construction, but they need to be assisted for hunger elimination and poverty reduction.

4 MITIGATION MEASURES

4.1 Mitigation Measures during Design Phase

4.1.1 General Design Instructions

Environmental matters have to be integrated in all the design work and planning of the project. The designing has to be done by minimising the adverse impacts on environment using as much as possible existing facilities and selecting the location of new facilities in areas where the disturbance to environment, people and existing structures is the smallest. Where possible existing rights-of-way has to be used rather than create new ones. The key mitigation measures are noticed in the Feasibility Study Main Report, Project Implementation Plan Bidding Documents and Contract Documents.

According to the Vietnamese Construction Regulation Standard Article 3.3 Protection of Natural Resources and Environment construction projects should:

- Not cause adverse effect to environment, and technical regulations on scenery and environment protection should be observed
- Protect the natural preservation areas, and historical, cultural and architectural places
- Extracting natural resource must ensure the rationality and cause no obstacle to the next exploitation
- Respect traditional customs, practices, religions of people living in and around the construction area.

In Construction Regulation Standard there are instructions especially for master plan including general instructions for designing sewerage and drainage system. Urban drainage system should be assured:

- To discharge all types of urban waste water
- To have suitable solution for treating wastewater so that the urban area is not flooded, and environment and water sources are not polluted.

In Standard Branch Sewerage and Drainage System and Works, Standard Designs there are more detailed design instructions. However, international design standards have to be introduced and used in design work.

The construction works should be implemented stepwise in order to minimize the moving/transferring of equipment as well as to avoid chaos for the surrounding communities.

In spite of the general mitigation measured concerning the whole project local special mitigation measures described in CEMP of An Cu and An Hoi wards have to be considered and followed.

4.1.2 Component 1: Tertiary Infrastructure

Design of Water Drainage

Special attention has to be paid to design of dredging work of the Xang Thoi Lake and Canal. Due to lack of proper access to the lake it is recommended that as much as possible of the dredged material should be used on site. If possible the dredged material could be used for filling of the Con arroyo. The garbage, which is blocking the canal and arroyos and top layer of the sediment, should be transported to the landfill, but the excavated soil could be used for construction. Handling and disposal of sediment and solid waste to specified places with suitable means of transportation has to be coordinated with relevant authorities.

Design of construction of embankment has to be done in cooperation with KfD project.

Transportation routes have to be designed in cooperation with traffic police and other relevant authorities.

Design of Bridges

The width of the bridges has to be adjusted to the width of the streets and alleys. The Vietnamese design standards have to be followed.

Design of Roads

Road alignments have to be designed avoiding possible cultural and historical monuments i.e. pagodas, temples and communal houses, also the need of resettlement has to be minimised.

Design of Street Lighting

In the design of electricity facilities special attention has to be paid to the safety regulations to prevent possibility of accidents. The Vietnamese design standards and safety regulations have to be followed in the design.

4.1.3 Component 2: Design of Resettlement Site

The resettlement site has to be planned as a complete residential area with sufficiently functions according to Vietnam planning standards. The technical standards applied for resettlement site design should be considered carefully to conform affordability of the modern households. Housing for the poor should be designed suitably with the affordability of the poor households

In the design of resettlement site has to be followed good design standard for new urban areas. Different facilities have to be located in the logical way, i.e. kindergarten and school near parks and recreational areas. There has to be easy access to market also with motorbikes and cars, and enough parking place has to be reserved and from the very beginning. Houses should be faced in the optimal way to protect from direct sunshine.

Proper access road to the resettlement site has to be designed, too.

In the proposed in situ resettlement site on the Con arroyo connections to the existing infrastructure has to be designed, because the narrow area is located in the middle of the residential area.

4.1.4 Public Hearings and Awareness

Although there has been community participation from the very beginning of project preparation and Community Upgrading Plans have been prepared and Community Environmental Management Plans will be prepared, it is necessary to inform people about the progress of the works during the design phase.

Draft Environmental Impact Assessment report has to be available in agreed public place in Vietnamese and leaflets have to be delivered to the people.

4.1.5 Linkage with Resettlement Action Plan

Living conditions and rights of the people already living on resettlement site should be considered in design. Design has to be done so that selected options require as little as possible resettlement. Site clearance has to be done in proper way. All the material has to be transported in agreed and appropriate place. As much as possible of material should be recycled.

4.2 Mitigation Measures during Construction Works

4.2.1 General

All works including to the Project have to be implemented following the appropriate standards, specifications and working methods given in the Contract Document.

4.2.2 Noise, Odour, Litter and Dust

Maximum permitted noise level in public and residential areas is given in Vietnamese standard TCVN 5949-1998. The strongest limitations are from 10 p.m. to 6 a.m. in the vicinity of hospitals, sanatoriums, libraries and kindergartens where maximum noise level is 40 dB.

During excavation and dredging works of lakes there will be a local odour nuisance to the public as long as the works will take place. To minimise the odour nuisance the especially the dredging works have to be carried out during dry season.

Release of nutrient and possible organic micro-pollutants and loose sediments during dredging works of the Xang Thoi Lake and Canal has to be minimised by using dry excavation and preventing direct discharge of water into the river.

It is extremely important to inform the local people in advance about the public nuisance during the dredging and other construction works.

Appropriate equipment should be used to prevent overloading of trucks and to collect accidental spills (sludge, oils from equipment, etc.) during rehabilitation, construction and dredging works.

The Constructor is responsible to collect all the solid waste from work sites and transport it to the landfill.

In the construction sites dust, litter and public inconvenience has to be minimised by good construction management and site supervision. To minimise dust emissions caused by construction works, sprinkling the streets with water is recommended in the vicinity of construction sites.

If there is a need for incineration of solid wastes at the construction sites, an appropriate control measure is required, and in some cases, the local authorities must approve these activities before starting implementation. Waste and disposal of excavated materials has to be disposed at the sites, which are agreed with URENCO.

4.2.3 Health and Safety

In all construction works local health and safety working methods and instruction given in Contract Documents have to be followed up.

Safety, Security and Protection of the Environment

The Contractor shall, throughout the execution and completion of the works and remedying of any defects therein:

- Have full regard for the safety of all persons entitled to be upon the site and keep the site and the works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons.
- Provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
- Take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

Accidents and Insurance

The Employer has no responsibility for injuries that may be suffered by employees of the Contractor, unless such injury results from an act or default of the Employer. In such circumstances the injured person would be regarded as a “third party” to the Employer and the Employer would have the benefit of the Third Party insurance.

The Contractor is required to insure his liability for death or injury to his own employees and he should also ascertain that all Subcontractors have similar insurance in force in regard to their employees.

During the execution of the works the Contractor shall keep the site reasonably free from all unnecessary obstructions and shall store or dispose of any Contractor's equipment and surplus materials and clear away and remove from the site any wreckage, rubbish or temporary works no longer required.

The Contractor shall have on his staff at the Site an officer dealing only with questions regarding the safety and protection against accidents of all staff and labour. This officer shall be qualified for his work and shall have the authority to issue instructions and shall take protective measures to prevent accidents.

Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour and, in collaboration with and to the requirements of the local health authorities, to ensure that medical staff, first aid equipment and stores, sick bay and suitable ambulance service are available at the camps, housing and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygienic requirements.

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.

The Contractor is responsible to provide appropriate equipment, tools and protective clothing to the workers.

The Contractor has to ensure that appropriate working methods are applied.

Anti-vibration mountings and noise insulation on equipment has to be used when possible. The Contractor has to provide and train how to use ear protectors for workers when noise level in the working place exceeds 85 dB.

The removed material from construction sites has to be handled, transported and disposed according to the safety instructions.

Safety and Health during Dredging of Lake and Canal

The Contractor has to follow strictly safety and health regulations during dredging of lakes, and during transportation and treatment of dredged sludge.

The dredging has to be organised so that the need to go to water is minimised.

Special attention has to be paid to avoid the direct contact with sludge. The Contractor has to provide protective clothing including waterproof overall, safety wellingtons and gloves. Workers have to use protective measures to avoid skin or eye contact.

A possibility to proper washing with clean water has to be arranged during and after the working. Clean water and first aid kit has to be available to wash and treat the possible cuts and wounds.

4.2.4 Traffic and Transportation Arrangements

All operations necessary for the execution and completion of the works and the remedying of any defects therein shall be carried on so as not to interfere unnecessarily or improperly with:

- The convenience of the public
- The access to, use and occupation of public or private roads and footpaths to or of properties whether in the possession of the Employer or of any other person.

The contractor shall use every reasonable means to prevent any of the roads or bridges communicating with or on the routes to the site from being damaged or injured by any traffic of the Contractor or any of his Subcontractors. In particular, the Contractor shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of materials, plant, Contractor's equipment or temporary works from and to the site shall be limited, as far as reasonably possible.

Transportation of Sludge from Channel

The nuisance caused by transportation of materials and especially dredged sludge has to be minimised by arranging transportation and construction on busy main streets only outside rush hours and in narrow streets in residential areas only during the day. The transportation has to be avoided between 10 p.m. to 6 a.m. and is allowed only on the request of traffic police. The noise level limitations given in the Vietnamese standard TCVN 5949-1998 have to be followed.

Careful planning of dredging, excavation, construction and transportation schedules, and planning and selection of routes, as well as choice of transportation vehicles will minimise dust.

Loads have to be covered tightly to minimise spread of dust and preventing dropping of material from the loads to the roads. Sludge from sewers with high water content has to be transported in special sludge tank to avoid any spills to the roads.

4.2.5 Working Time and Site Arrangements

Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The

Contractor shall prepare and submit to the Employer, with a copy to the Engineer, proposed Site regulations for the Employer's approval, which approval shall not be unreasonable withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the facilities, gate control, sanitation, medical care, and fire prevention.

Sign to show the name of the Project, the name of Employer and the name of Contractor has to locate in visible place in the construction site.

Site Clearance

Site Clearance in course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

Clearance of the Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site, and shall leave the Site and Facilities clean and safe.

Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

Work at Night and on Holidays

Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the Site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Engineer.

4.2.6 Public Relations

The District PMU shall announce the construction works and new traffic arrangements during construction works to the public regionally in newspapers, TV and radio. Locally the announcement is given to the ward representatives who will inform the residents. Loudspeakers can be used during the construction work to give the latest information in concerning areas. It is extremely important to inform the local people in advance about the public nuisance and especially possible odour nuisance during dredging of lake and canal.

4.3 Mitigation Measures during Operation

4.3.1 Component 1: Tertiary Infrastructure

The instructions agreed in CUPs and CEMPs have to be followed, i.e.

- Regular inspection of the condition of drainage system, water supply system and electricity system, possible breakages have to be repaired immediately
- Prevent solid waste disposal into the alleys and drainage by improved solid waste management
- Meet operational and safety standards

Assign the responsibility of channel and arroyo maintenance to each household, each habitant group or each ward.

4.3.2 Component 2: Resettlement Site

The good operation and maintenance governance has to be followed concerning the use of all infrastructure facilities. Possible breakages and problems have to be prepared and solved as soon as possible. Special attention has to be paid to the operation and maintenance of infrastructure facilities.

4.4 Summary of Mitigation Measures

Table 4.1 Summary of Mitigation Measures

Phase	Main mitigation measures	Responsible organisation
Design	<ul style="list-style-type: none"> - International and Vietnamese design criteria and standards to be used - Drainage and widening of alleys designed so that need for resettlement is minimised - Works designed to implemented during dry season 	Design Consultant Design Consultant
Construction	<ul style="list-style-type: none"> - Minimise dust, odour, litter, noise and traffic emissions by good operation management and site supervision - Appropriate working methods have to be followed - Sites have to be kept clean and safe during and after the work - Safety and health regulations has to be strictly followed - Transportation has to be minimised and routes selected to avoid public nuisance - Transportation during rush hours and night has to be avoided - Tight and proper equipment to transport sediment and garbage has to be used to avoid accidental spills and odour nuisances - Construction sites and time has to be informed to the local people in advance 	Contractor Contractor Contractor Contractor Contractor Contractor PMU
O&M	<ul style="list-style-type: none"> - Follow Project Operations Manual, CUPs, CEMPs and EMP - Minimise dust, odour, litter, noise and traffic emissions by good operation and maintenance supervision - Appropriate working methods have to be followed - Immediate preparation of breakages 	PMU PMU PMU Communities

5 MONITORING PROGRAMMES

PMU coordinates with various local departments and sectors and community work teams to technically, socially and environmentally monitor and supervise the Project during the construction, operation and maintenance of the Works.

Table 5-1 Environmental Monitoring during Construction

Upgrading Activities	What to monitor	How often	How	Responsibility	Mitigation measures
Water supply	Excavated soil	Every day	Observation	Community work team	Covering vehicle trunks
	Dust	Every day	(ditto)	(ditto)	Watering in front of houses
Roads	Excavated soil, materials	Every day	(ditto)	(ditto)	Covering vehicle trunks
	Dust	Every day	(ditto)	(ditto)	Watering in front of houses
Drainage	Excavated soil	Every day	(ditto)	(ditto)	Covering vehicle trunks
	Dust	Every day	(ditto)	(ditto)	Watering in front of houses
Dredging	Sludge handling	Every day	(ditto)	(ditto)	Using specific vehicles
	Sludge transfer site	Every week	Inspection	URENCO	Sludge water drainage system
	District officer	Every week	Inspection	URENCO	

Table 5-2 Environmental Monitoring during Operation

Upgrading Activities	What to monitor	How often	How	Responsibility
Water supply	Quality	Every day	Observation	Households
	Pressure, leakage	Every day	Observation	Households
Drainage	Sediment	Every 6 months	Checking	Community leader
	Clogging	Weekly	Observation	Community leader
Solid waste	Condition around transfer site	Every day	Observation	Households
	Transport	Every 2 days	Observation	Community leader
	Disposal site	Year	Checking	URENCO
Air quality	Odour	Every day	Observation	Households
	Smoke	Every day	Observation	Households
	Dust	Every 3 months	Measuring	DOSTE
	Noise	Every 3 months	Measuring	DOSTE

Monitoring of water and sediment quality the Xang Thoi Lake and Canal should be agreed with the PMU and DONRE. It is recommended that the same water and sediment sampling points and parameters should be used as in the survey done in September 2003 to follow-up the impacts of the project.

More detailed sampling programme will be presented in the Final Environmental Impact Assessment report.

6 CAPACITY DEVELOPMENT AND TRAINING

6.1 Project Management Model

The People's Committee of Can Tho City is the Investor of Can Tho Urban Upgrading Project, therefore the World Bank will work directly with the People's Committee.

The People's Committee of Can Tho City has established PMU under the direct control of the City People's Committee for managing and implementing the Project.

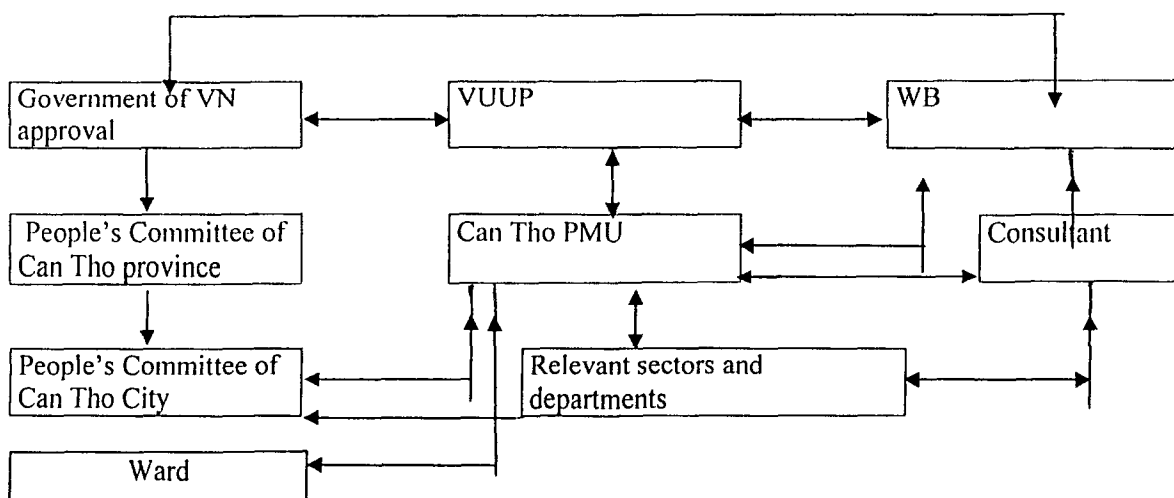


Figure 6-1 Organization chart for Project Implementation

PMU will manage and deal with all issues related to the Project implementation. PMU will also supervise and control activities of Suppliers and Contractors of the Project as well as assist the construction management of the Project. PMU will be responsible for all the work of calculation, filing, reporting and budget for the Project. To PMU staff should include specialists of technique, accounting, environment, social and project management. International and local consultants hired for construction supervision and technical assistance shall directly make reports to PMU on the progress of the contracted work.

PMU will be responsible for:

- Financial management for the project
- Dealing with all issues with contracts related to the project planning and implementation
- Preparation for land acquisition
- Reports on progress of the project implementation to financial authorities and local authorities
- Co-ordination with other sectors and departments to deal with such services as water supply and electricity
- Control of the bidding process and selection of construction contractors, including bid invitation, bid evaluation and contract drafting
- Support for planning and implementation of community upgrading plans

- Strengthening capacity of PMU for operation and maintenance of the current environment hygiene equipment and the new one

6.2 Relations between Project implementing entities and other authorities

Because the project is multi-sectoral PMU should maintain close ties with various sectors and departments in the Province, the City and ministries:

- The People’s Committee of the Province is in charge of approval of resettlement site planning, phased projects, project components, technical design and total cost estimate, bid invitation packages and bid results
- Department of Construction is responsible for evaluating resettlement site planning and submission to the PC of the Province for approval
- Department of Planning and Investment is responsible for evaluating technical support reports; evaluating project components; evaluating bid invitation packages; evaluating bid selection results for submission to the PC of the province for approval. Simultaneously the Department is also responsible for allotment of annual capital plan for the project implementation in accordance with the schedule.
- Cadastral Department is responsible for making procedures for land acquisition and hand over to PMU for execution of the resettlement quarter in Thoi Nhat hamlet, An Binh Commune and other work related to compensation and site clearance within the project coverage
- Department of Industry is responsible for evaluating the technical design package of the low voltage power and lighting systems of the primary, secondary and tertiary infrastructure for submission to the PC of the Province for approval.
- Cadastral Board of Can Tho City and the Board of Construction, Housing and Land are responsible for BOLUCs for households within the affected zone of the Project.
- Can Tho Power Company is responsible for co-ordination to assure the connection of the low voltage network and the stations for the power system of the Project
- Can Tho Water Supply Company is responsible for co-ordination to assure the connection of the water supply system between the water treatment plant and the required network of the Project
- Urban Works Company is responsible for organization and co-ordination for solid waste collection and handling for upgrading quarters of the Project
- Health Care Centre of Can Tho City; Board of Education and Board of Market Management of Can Tho City are responsible for co-ordinating with PMU for upgrading social infrastructure works managed by the sectors
- PCs at ward level are responsible for closely co-ordinating with PMU in CUPs, plans for environmental impact assessment in upgrading quarters of the Project as well as in resettlement site
- Department of Transportation is responsible for assessing the projects affecting urban infrastructure such as access roads, water supply and drainage for submission to the Provincial PC for approval
- Department of Natural Resources and Environment is responsible for assessing the Report on environmental impact assessment of the Project for submission to the Provincial PC for approval.

Because component projects fall in categories B and C, the Government has authorized the PC of Can Tho Province directly to approve the project components to shorten the time for procedure dealing for capital construction as well as for the overall time schedule of the Project.

Throughout the Project implementation, the World Bank will guide the project with the frequent supervision. The representative office of the World Bank in Hanoi will coordinate activities of the Project, provide comments and support in implementation methods as well as financial procedures for the timely and effective implementation of the Project.

6.3 Financial Management

PMU should open three accounts: one special account for funds from the WB; one for counterpart capital and one for capital contributed by the community, this amount will be collected by Groups and Wards then deposited to the account.

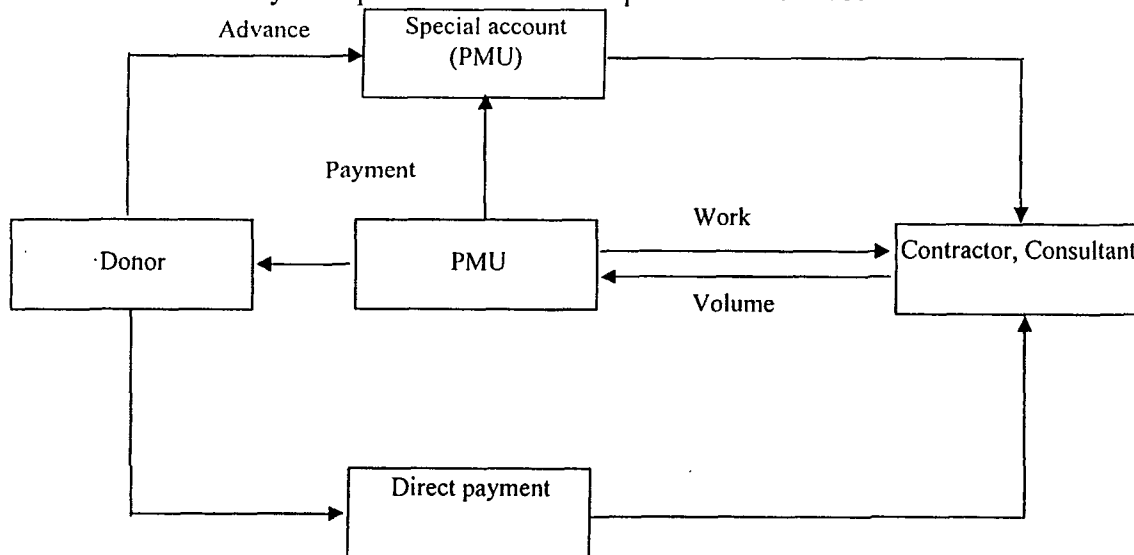
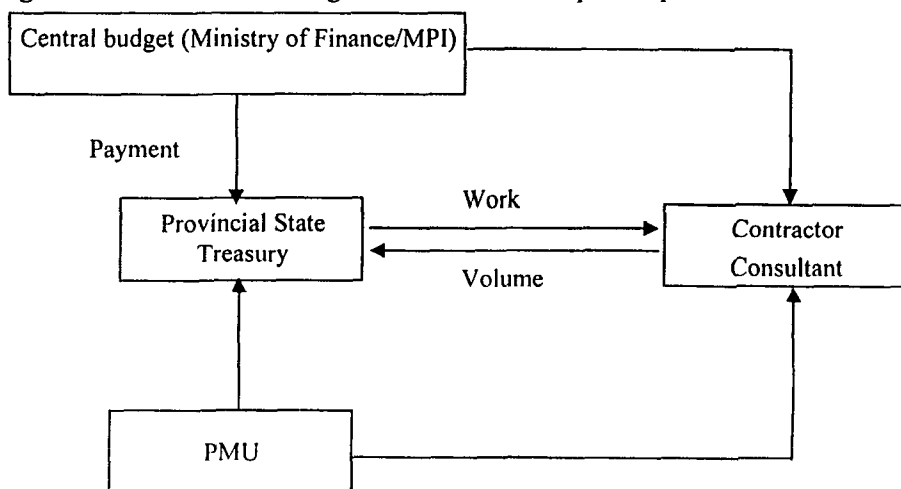


Figure 9-2 Financial Management and counter part capital



6.4 Training during Design, Construction and Operation Phase

During the preparation of the Draft Environmental Management Plan the CEMP was not available, yet, and therefore only preliminary proposals for environmental training was available.

Environment education and community awareness enhancement program (for habitants) and environment management capacity building (for management officials) is including the following items:

- Improve people' awareness on environmental protection to realize that it's necessary to protect their own living and working environment, and to consider the environment as the asset to be preserved and protected
- Use mass media and organize training workshops for management officials and habitants to acquire basic contents of the laws on environment and the necessity of strict monitoring
- Educate the awareness on saving, rational and effective use of the natural resources such as fuel, energy, water and land etc.
- Educate the awareness on environmental protection and hygiene. Hygiene and waste management programs in the quarters should be frequently conducted.
- Take an active part in implementation of environment protection plans according to general regulations and instructions of Can Tho City authorities. Educate and encourage habitants in the quarters to follow the regulations on fire and explosion protection. Health examination should be periodically carried out.
- Observe the laws on environment and report all environmental incidents to relevant authorities.

The more detailed environmental training plan will be presented in the Final Environmental Management Plan.

7 IMPLEMENTATION SCHEDULE AND COST ESTIMATES

7.1 Implementation plan of components of Phase 1

The detailed plans for project actions will be presented in the Final Environmental Management Plan.

7.2 Cost Estimation

The following cost estimation is according to the approved feasibility study from July, and the total cost estimations have not been updated, yet. Therefore, these figures are only tentative and only for reference. There have been many changes to the content of components of the project. For the different options of dredging of the Xang Thoi Lake and Canal and related works have been prepared separate cost estimations.

All the cost estimations will be updated and mitigation cost will be presented in the Final Environmental Management Plan.

Table 12-1 Total investment capital and investment phases according to FS in July 2003

	VND	USD	WB		Central budget (USD)
			%	(USD)	
<i>Component 1</i>					
Tertiary infrastructure upgrading					
a) Road	6,671,790,745	436,065	90	392,458	43,606
b) Water drainage	7,887,222,600	515,505	90	463,954	51,550
c) Water supply	3,656,744,485	239,003	90	215,103	23,900
d) Toilet	800,000,000	52,288	90	47,059	5,229
e) Solid waste collection	204,120,000	13,341	100	13,341	0
f) Lighting	2,391,782,060	156,326	90	140,693	15,633
g) Box culverts in quarters 4 and 6	35,000,000	2,288	90	2,059	229
h) Social infrastructure (schools, clinics)	4,310,031,000	281,701	90	253,531	28,170
<i>Sub-total (Component 1)</i>	25,956,690,890	1,696,516		1,528,198	168,317
<i>Component 2</i>					
Secondary infrastructure upgrading					
a) Road (roads surrounding Xang Thoi lake - phase 1)	2,995,200,000	195,765	90	176,188	19,576
b) Water drainage (embankment surrounding Xang Thoi lake)	56,733,350,000	3,708,062	90	3,337,256	370,806
c) Street lighting	534,000,000	34,902	90	31,412	3,490
d) Bridge	12,624,000,000	825,098	90	742,588	82,510
e) Fire equipment and solid waste collection equipment	6,339,845,700	414,369	100	414,369	0
<i>Sub-total (Component 2)</i>	79,226,395,700	5,178,196		4,701,813	476,383

<u>Component 3</u>		-		0	0
Houses for poor people		-		0	0
a) Resettlement house (attached houses)	17,319,000,000	1,131,961	100	1,131,961	0
c) Infrastructure of resettlement area (inside)	30,537,133,000	1,995,891	90	1,796,302	199,589
d) Social infrastructure in resettlement area	10,620,200,000	694,131	90	624,718	69,413
e) Infrastructure of resettlement area (outside)	11,000,000,000	718,954	90	647,059	71,895
f) Land and compensation (buying and compensating)	61,166,400,000	3,997,804	0	0	3,997,804
Sub-total (Component 3)	130,642,733,000	8,538,741		4,200,039	4,338,702
<u>Component 4</u>		-		0	0
House and land management		-		0	0
a) Equipment	4,451,688,000	290,960	100	290,960	0
b) Technical assistance and training, map updating	2,542,000,000	166,144	100	166,144	0
Sub-total (Component 4)	6,993,688,000	457,104		457,104	0
<u>Component 5</u>		-		0	0
a) Small credit	12,880,000,000	841,830	100	841,830	0
e) Institute assistance	566,175,000	37,005	100	37,005	0
Sub-total (Component 5)	13,446,175,000	878,835	100	878,835	0
<u>Component 6</u>				0	0
a) PMU (1,2% of construction costs)	2,095,744,000	136,977	0	0	136,977
b) Technical assistance for PMU	5,010,500,000	327,484	100	327,484	0
c) Design and supervision	14,664,850,000	958,487	100	958,487	0
d) Training	1,200,000,000	78,431	100	78,431	0
e) Other capital construction	5,945,218,000	388,576		771,571	-382,995
Sub-total (Component 6)	28,916,312,000	1,889,955		2,135,973	-246,018
Main cost	285,181,994,590	18,639,346		13,901,962	4,737,384
Technical contingency cost (10% x construction costs of social infrastructure)	13,602,830,000	889,074		937,762	-48,688
Total cost (Main costs + technical costs)	298,784,824,590	19,528,420		14,839,725	4,688,695
Price contingency (3% x main costs + technical costs)	8,963,544,738	585,853		445,192	140,661
Total investment cost	307,748,369,328	20,114,273		15,284,916	4,829,356

7.3 Investment capital source

Project has received the support from World Bank by a loan for Vietnam Government. There is also a non-refunding grant from Japanese Government for project preparation; counterpart funds, including local budget and people's contribution.

Financial schedule is as follows:

- IDA loan: about 90% of total cost for construction, procurement and equipment.
- Counterpart funds: at least 10% of total cost
 - Local budget: about 7 %

-
- Community contribution: about 3% for Component I
 - Compensation cost for land and housing of project affected households and other costs

Other funds: a grant from Japanese Government for project preparation

According to the Memorandum of Understanding dated May 12, 2003 between the WB and Can Tho City PC households getting benefits from the Project should contribute an average 3% of the counterpart capital for tertiary infrastructure for construction of alleys, power system and drainage. The actual contribution of each household will be determined in communities according to their financial capacity. The contribution will include costs for power connection, but the households themselves will pay for electricity meters.

8 ENVIRONMENTAL REPORTING

Environmental reporting is a part of biannual review of the progress of the project. In environmental chapter should be described the main results of the monitoring and possible changes and justifications from the agreed programme. In the environmental section should be handled the monitoring of the main components i.e. water supply, drainage and alleys.

Different level of organisations should prepare their own reports and PMU would then compile these sub-reports to the environmental section of biannual report. The reporting chain is as follows:

- Communities report the grass root level environmental activities, monitoring and possible problems according to the monitoring programme agreed in CEMPs
- Wards collect the data from LIAs including to their area
- Districts collect the data from wards and submit the data to PMU
- Companies responsible for O&M will collect data from their activities and submit the data to PMU
- PMU compile the environmental data and add it the to biannual progress report which is submitted to the WB
- DONRE has the overall management responsibility of environmental issues and biannual report has to be submitted also to them

ANNEX 1

Environmental Impacts of the Proposed Components of Phase I

Annex 5.1 Identification, Management and Monitoring of Impacts related to Component 1: Upgrading of Xang Thoi lake and Canal

ISSUE	EXTENT	POTENTIAL IMPACTS	MANAGEMENT MEASURES	NET EFFECTS	MONITORING, FOLLOW-UP
Air Emissions during Construction	Vicinity of construction equipment Local	Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases. Possible foul odour from sediment during dredging.	No measures necessary.	Minimal impacts.	Not required.
Noise during Construction	Vicinity of construction equipment. Local	Short-term noise associated with construction works. Short-term noise effect in populated areas.	Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.	Short-term impacts.	Not required.
Construction and Operation of Drainage	Local along the lake and channel	Dredging and transportation of the dredged material will disturb the daily life during construction. Overall improvement of drainage system including lake, canal and arroyos. Decrease of flooding. Improved hygienic and environmental conditions.	Solid waste and the top layer of sediment have to be transported to the landfill. As much as possible of the excavated material has to be used near the site i.e. for filling of Con arroyo. Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed.	Major positive impact on the overall environmental and hygienic conditions. Long-term positive impacts. Short-term negative impacts during construction and dredging.	Construction management supervision. Regular monitoring of conditions of drainage system.

Annex 5.2 Identification, Management and Monitoring of Impacts related to Component 1: Bridges

ISSUE	EXTENT	POTENTIAL IMPACTS	MANAGEMENT MEASURES	NET EFFECTS	MONITORING, FOLLOW-UP
Air Emissions during Construction	Vicinity of construction equipment Local	Minimal emissions of NO _x , CO, CO ₂ and particulates from the engines of the construction equipment and traffic will have a small and a short-term effect on local air quality and an infinitesimal effect on global greenhouse gases. Dust emissions from traffic related to construction works.	No measures necessary.	Short-term impacts.	Not required.
Noise during Construction	Vicinity of construction equipment. Local	Short-term noise associated with construction works. Short-term noise effect in populated areas.	Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.	Short-term impacts	Not required.
Air Emissions and Noise during Operation	Local	Most probably traffic will increase and therefore amount of air emissions, noise and traffic jams will be increased. On the other hand traffic will be easier when narrow bridges are widened.	Avoid by-passing traffic, only local traffic. Avoid to use low-quality motorbikes causing high amount of air emissions.	Long-term permanent impacts.	Regular air quality monitoring along the busiest alleys.
Social and Financial Impacts	Local	Bottlenecks in traffic will be decreased and traffic will flow smoothly. Number of traffic accidents might increase due to the increased traffic volume.	Traffic education to everybody but especially for children at kindergarten and schools.	Long-term permanent impacts.	Regular follow-up of number of traffic accidents in community level.

Annex 5.3 Identification, Management and Monitoring of Impacts related to Component 1: Roads					
ISSUE	EXTENT	POTENTIAL IMPACTS	MANAGEMENT MEASURES	NET EFFECTS	MONITORING, FOLLOW-UP
Air Emissions during Construction	Vicinity of construction equipment Local	Minimal emissions of NO _x , CO, CO ₂ and particulates from the engines of the construction equipment and traffic will have a small and a short-term effect on local air quality and an infinitesimal effect on global greenhouse gases. Dust emissions from traffic related to construction works.	No measures necessary.	Short-term impacts.	Not required.
Noise during Construction	Vicinity of construction equipment. Local	Short-term noise associated with construction works. Short-term noise effect in populated areas.	Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.	Short-term impacts	Not required.
Air Emissions and Noise during Operation	Local	Most probably traffic will increase and therefore amount of air emissions, noise and traffic jams will be increased.	Avoid by-passing traffic, only local traffic. Avoid to use low-quality motorbikes causing high amount of air emissions.	Long-term permanent impacts.	Regular air quality monitoring along the busiest alleys.
Social and Financial Impacts	Local	Road around the lake and canal will improve remarkably recreational possibilities in the area. Access to houses will be improved and more possibilities for small-scale business. Bottlenecks in traffic will be decreased and traffic will flow smoothly. Number of traffic accidents might increase due to the increased traffic volume.	Traffic education to everybody but especially for children at kindergarten and schools.	Long-term positive permanent impacts.	Regular follow-up of number of traffic accidents in community level.

Annex 5.4 Identification, Management and Monitoring of Impacts related to Component 1: Street Lighting					
ISSUE	EXTENT	POTENTIAL IMPACTS	MANAGEMENT MEASURES	NET EFFECTS	MONITORING, FOLLOW-UP
Air Emissions during Construction	Vicinity of construction equipment Local	Minimal emissions of NO _x , CO, CO ₂ and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.	No measures necessary.	Minimal impacts.	Not required.
Noise during Construction	Vicinity of construction equipment. Local	Short-term noise associated with construction works. Short-term noise effect in populated areas.	Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.	Short-term impacts.	Not required.
Construction and Operation of Street Lighting Supply System	Local	Improvement of security and safety situation and decrease of accidents due to the better lighting during evening and night. Improvement of possibilities for legal business life.	Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. During operation O&M has to be done, immediate repairing of broken lamps or any other breakages.	Long-term positive impacts.	Construction management supervision. Operation monitored on the community level.

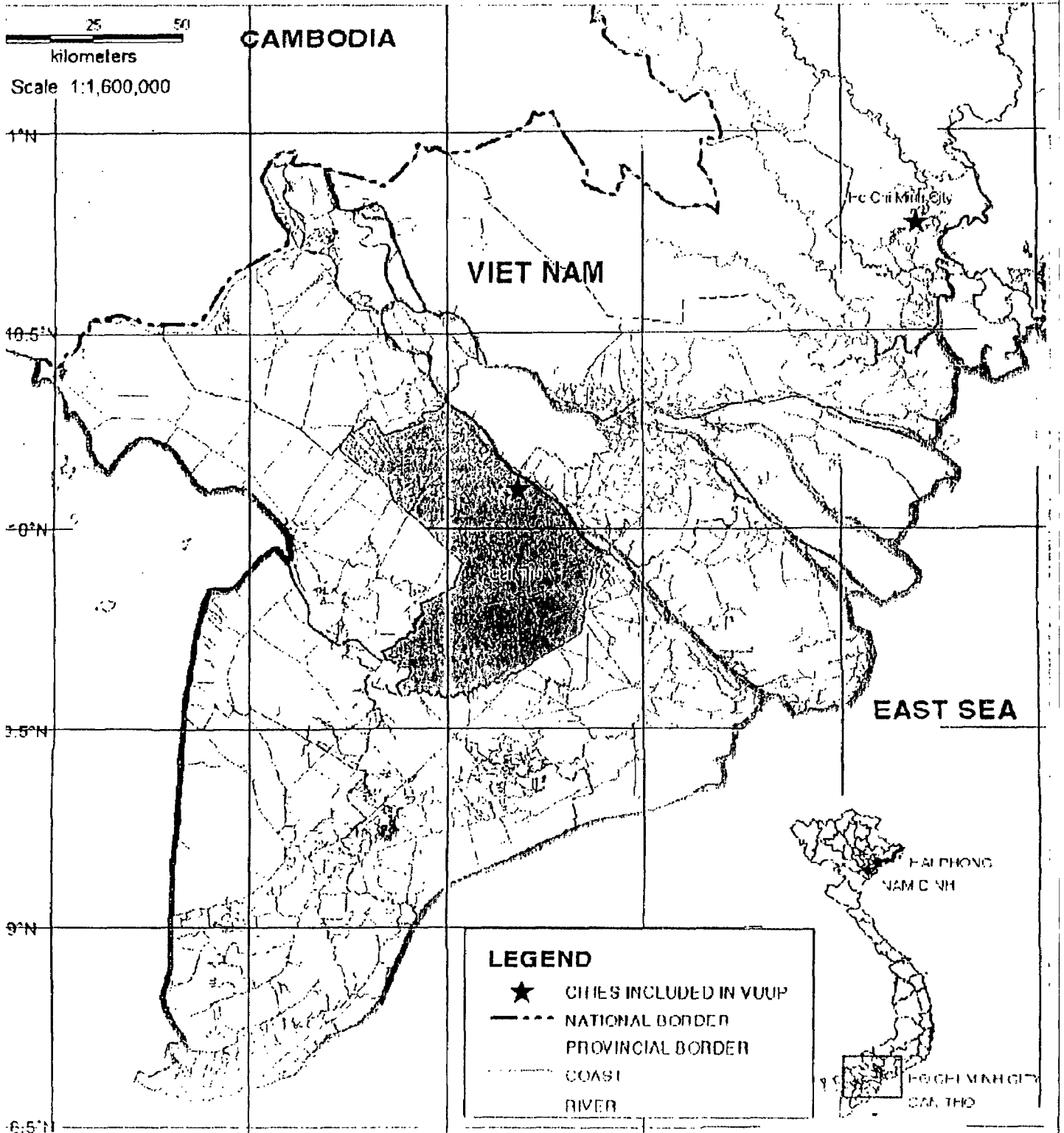
Annex 5.5 Identification, Management and Monitoring of Impacts related to Component 2: Resettlement Site

ISSUE	EXTENT	POTENTIAL IMPACTS	MANAGEMENT MEASURES	NET EFFECTS	MONITORING, FOLLOW-UP
Selection and Design of Resettlement Site	Local	Need of resettlement in the proposed area.	Resettlement site has to be located in sparsely populated area to avoid additional need of resettlement. However, site has to be close enough to the area from where the PAPs are relocated to avoid social problems. Design of site has to be done according to the agreed design standards and regulations. Surrounding land use and facilities have to be considered.	Short-term impacts.	Instructions given in RAP have to be followed.
Air Emissions during Construction	Vicinity of construction equipment Local	Minimal emissions of NO _x , CO, CO ₂ and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.	No measures necessary.	Minimal impacts.	Not required.
Noise during Construction	Vicinity of construction site. Local	Short-term noise associated with construction. Short-term noise effect in populated areas.	Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.	Short-term impacts.	Not required.
Construction of Resettlement Site	Local	Short-term impacts during construction. In situ resettlement site on Con arroyo will be in the middle of residential area. Filling of Con arroyo does not impact on hydraulic capacity of the drainage system.	Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. All planned facilities and services have to be constructed. Filling and foundation works of the Con arroyo has to be done according to the site investigations and foundations has to be done according to the design to avoid soil subsidence.	Long-term positive impacts.	Construction management supervision.

Annex 5.5 Identification, Management and Monitoring of Impacts related to Component 2: Resettlement Site

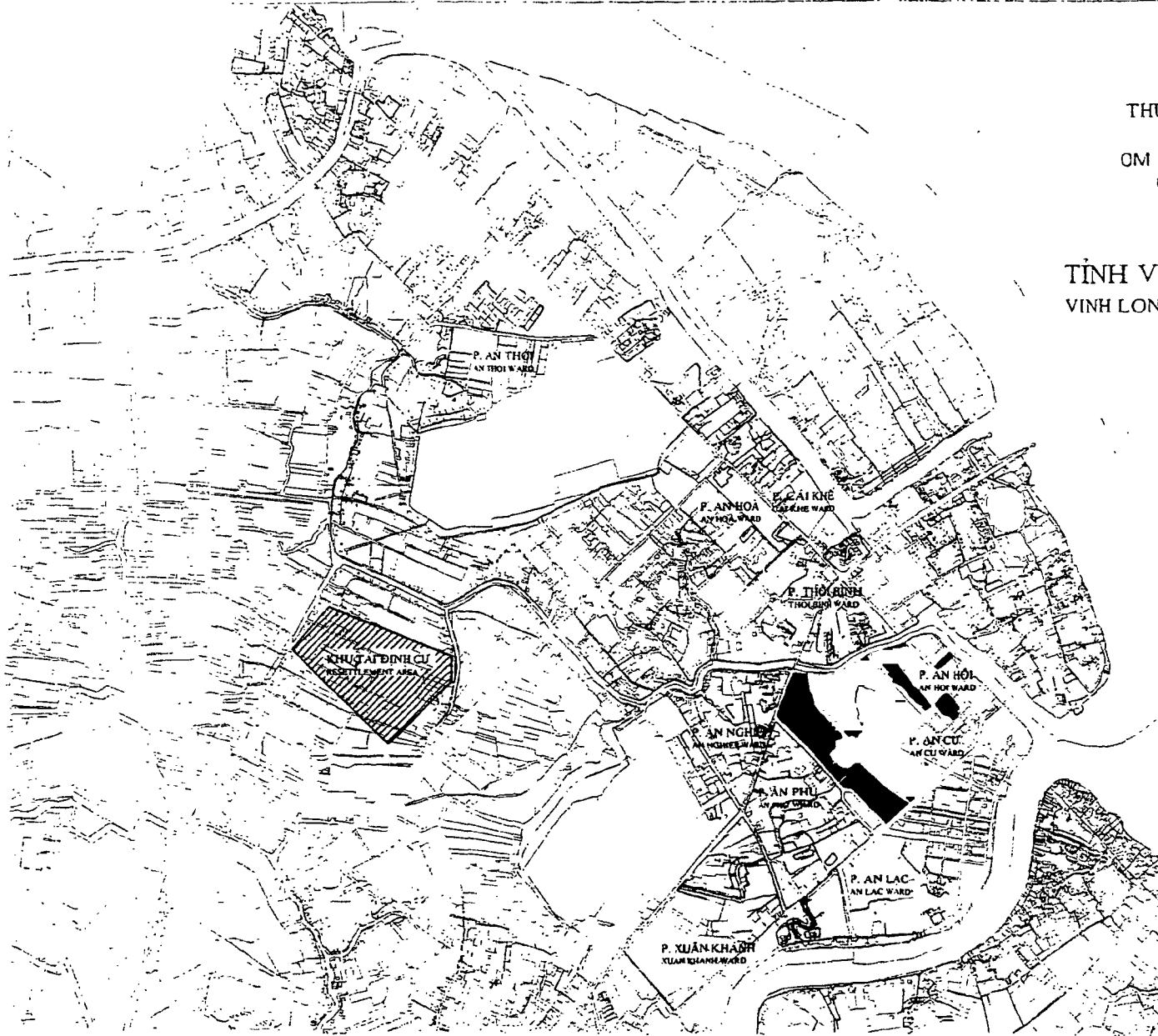
ISSUE	EXTENT	POTENTIAL IMPACTS	MANAGEMENT MEASURES	NET EFFECTS	MONITORING, FOLLOW-UP
Operation of Resettlement Site	Long-term local.	Significant improvement of living conditions of PAPs due to the proper infrastructure and services. Establishment of new social network and business life takes time for new residents and local administration.	No measures necessary.	Very positive long-term impacts.	Follow-up of social adaptation to the new living area on the community level.

LOCATION OF VUUP CAN THO SUB-PROJECT
 VỊ TRÍ DỰ ÁN NÂNG CẤP ĐÔ THỊ - TIỂU DỰ ÁN CẦN THƠ



VIỆN KỸ THUẬT ĐÔ THỊ VÀ KỸ THUẬT ĐÔ THỊ INSTITUTION OF URBAN AND URBAN ENGINEERING		
ĐƠN VỊ CHỈ ĐẠO DỰ ÁN PROJECT MANAGEMENT UNIT	VIỆN ĐÔ THỊ VÀ KỸ THUẬT ĐÔ THỊ INSTITUTION OF URBAN AND URBAN ENGINEERING	SỐ BẢN VẼ DRAWING NO.
VIỆN KỸ THUẬT ĐÔ THỊ VÀ KỸ THUẬT ĐÔ THỊ INSTITUTION OF URBAN AND URBAN ENGINEERING	VIỆN ĐÔ THỊ VÀ KỸ THUẬT ĐÔ THỊ INSTITUTION OF URBAN AND URBAN ENGINEERING	SỐ BẢN VẼ DRAWING NO.
		CT-01

LOCATION OF CAN THO SUB-PROJECT COMPONENT 1 AND RESETTLEMENT SITE
 VỊ TRÍ HẠNG MỤC 1 VÀ KHU TÁI ĐỊNH CƯ TIỂU DỰ ÁN CẦN THƠ



TỈNH VĨNH LONG
 VINH LONG PROVINCE

GHI CHÚ:
 NOTES

- KHU VỰC CẦN NÂNG CẤP GĐ I
THE AREA TO BE UPGRADED IN PHASE I
- KHU TÁI ĐỊNH CƯ VĨNH LỘC B
VINH LOC B RESETTLEMENT SITE
- SÔNG RẠCH
RIVER AND CANAL

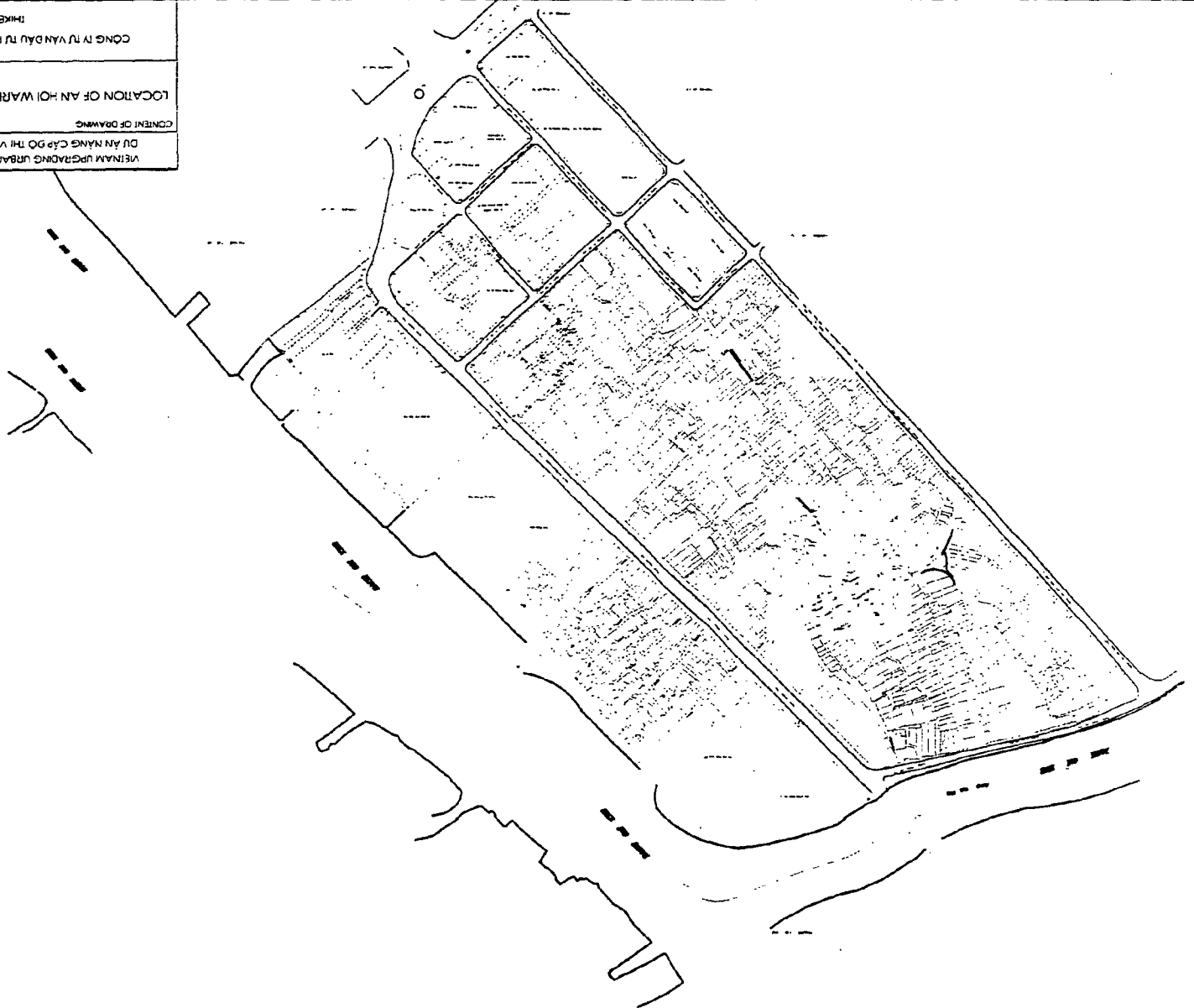
VIỆT NAM UPGRAADING URBAN PROJECT - CAN THO SUB-PROJECT DỰ ÁN NÂNG CẤP ĐÔ THỊ VIỆT NAM - TIỂU DỰ ÁN TP. CẦN THƠ	
CONTENT OF DRAWING	NỘI DUNG BẢN VẼ:
LOCATION OF CAN THO SUB-PROJECT COMPONENT 1 AND RESETTLEMENT SITE	VỊ TRÍ HẠNG MỤC 1 VÀ KHU TÁI ĐỊNH CƯ TIỂU DỰ ÁN CẦN THƠ
CÔNG TY TƯ VẤN ĐẦU TƯ PHÁT TRIỂN VÀ XÂY DỰNG THKECO	DRAWING NO. BẢN VẼ SỐ CT-02

LOCATION OF AN CU WARD
VỊ TRÍ PHƯỜNG AN CU



VIETNAM UPGRADING URBAN PROJECT - CAN THO SUB-PROJECT DỰ ÁN NÂNG CẤP ĐỘ THỊ VIỆT NAM - RIÊU DỰ ÁN TP. CẦN THƠ	
CONTENT OF DRAWING LOCATION OF AN CU WARD	NỘI DUNG BẢN VẼ VỊ TRÍ PHƯỜNG AN CU
CÔNG TY TƯ VẤN ĐẦU TƯ PHÁT TRIỂN VÀ XÂY DỰNG THIKECO	DRAWING NO. BẢN VẼ SỐ CT - 03

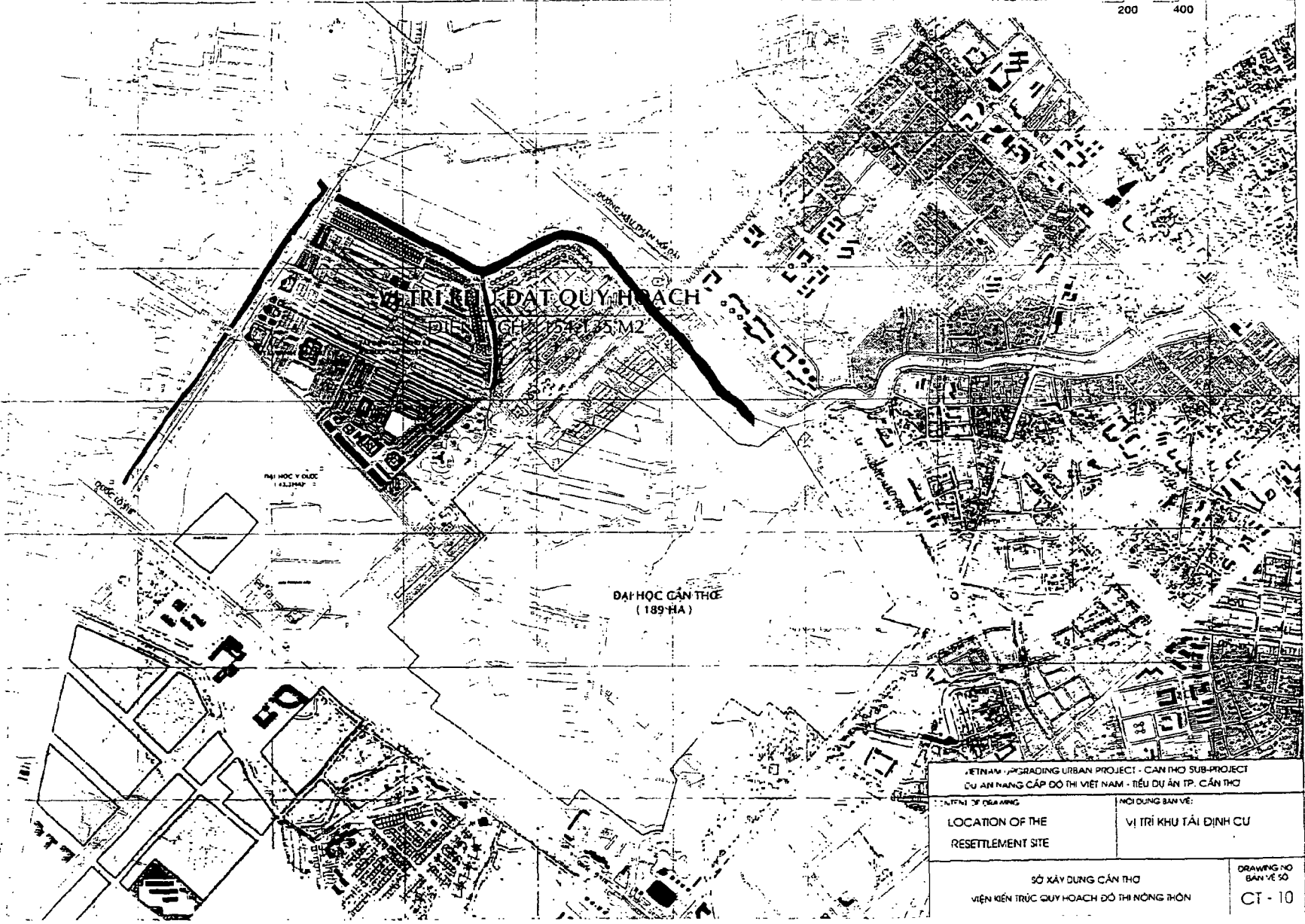
DRAWING NO BAN VE SO		CÔNG TY TƯ VẤN ĐẦU TƯ PHÁT TRIỂN VÀ XÂY DỰNG THKECO	
VI TRÍ PHƯỜNG AN HỘI		LOCATION OF AN HOI WARD	
NƠI DÙNG BẢN VẼ:		CONTENT OF DRAWING	
DỰ ÁN NÂNG CẤP ĐỒ THỊ VIỆT NAM - TIỂU DỰ ÁN TP. CẦN THƠ VIETNAM UPGRADING URBAN PROJECT - CAN THO SUB-PROJECT			



LOCATION OF AN HOI WARD
VI TRÍ PHƯỜNG AN HỘI

LOCATION OF THE RESETTLEMENT SITE
 VỊ TRÍ KHU TÁI ĐỊNH CƯ

200 400



VIETNAM UPGRADE URBAN PROJECT - CAN THO SUB-PROJECT DỰ ÁN NÂNG CẤP ĐỘ THỊ VIỆT NAM - TIỂU DỰ ÁN TP. CẦN THƠ	
CONTENT OF DRAWING LOCATION OF THE RESETTLEMENT SITE	NỘI DUNG BẢN VẼ: VỊ TRÍ KHU TÁI ĐỊNH CƯ
SỞ XÂY DỰNG CẦN THƠ VIỆN KẾT TRÚC QUY HOẠCH ĐÔ THỊ NÔNG THÔN	
DRAWING NO BẢN VẼ SỐ CT - 10	

GENERAL LAYOUT OF THE RESETTLEMENT SITE QUY HOẠCH TỔNG THỂ KHU TẠİ DĨNH CƯ

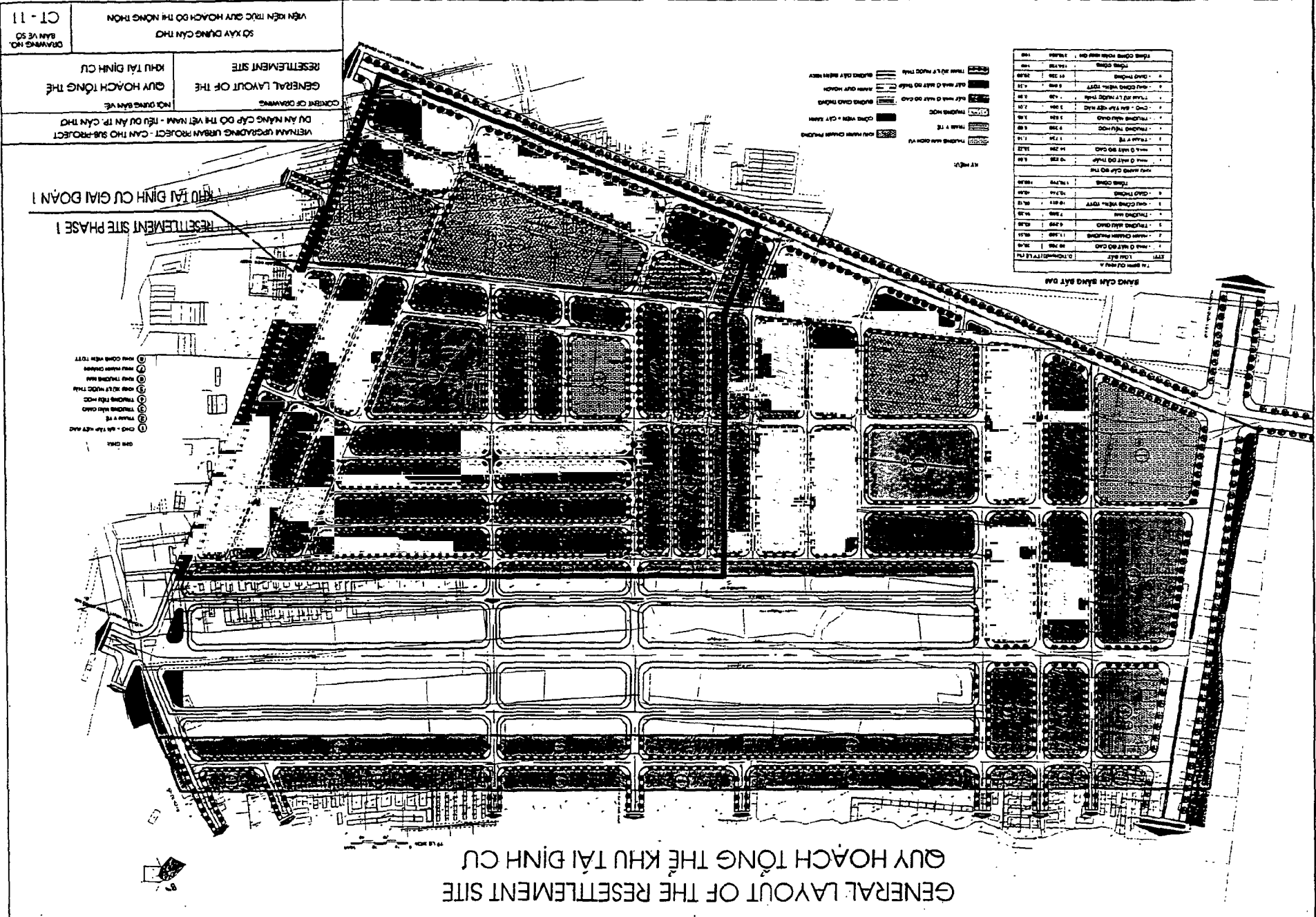


TABLE 1: GENERAL LAYOUT OF THE RESETTLEMENT SITE

NO.	NAME	AREA (HA)	PERCENTAGE (%)
1	RESIDENTIAL	120.00	40.00
2	COMMERCIAL	80.00	26.67
3	PUBLIC SERVICES	40.00	13.33
4	INDUSTRIAL	60.00	20.00
5	OPEN SPACE	100.00	33.33
6	ROADS	20.00	6.67
7	UTILITIES	10.00	3.33
8	WATERWAYS	5.00	1.67
9	OTHER	5.00	1.67
TOTAL	300.00	100.00	100.00

- LEGEND
- THANG 1: THANG 1
 - THANG 2: THANG 2
 - THANG 3: THANG 3
 - THANG 4: THANG 4
 - THANG 5: THANG 5
 - THANG 6: THANG 6
 - THANG 7: THANG 7
 - THANG 8: THANG 8
 - THANG 9: THANG 9
 - THANG 10: THANG 10
 - THANG 11: THANG 11
 - THANG 12: THANG 12
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 - THANG 42: THANG 42
 - THANG 43: THANG 43
 - THANG 44: THANG 44
 - THANG 45: THANG 45
 - THANG 46: THANG 46
 - THANG 47: THANG 47
 - THANG 48: THANG 48
 - THANG 49: THANG 49
 - THANG 50: THANG 50

VIỆN KIẾN TRÚC QUY HOẠCH ĐÔ THỊ NÔNG THÔN
SỞ XÂY DỰNG CẦN THƠ
GENERAL LAYOUT OF THE RESETTLEMENT SITE
KHU TẠİ DĨNH CƯ
CONCEPT OF DRAWINGS
NƠI DỰNG BẢN VẼ

VIỆT NAM UPGRADE URBAN PROJECT - CAN THO SUB-PROJECT
DỰ AN NÂNG CẤP ĐÔ THỊ VIỆT NAM - NƠI DỰ AN TP. CẦN THƠ
RESETTLEMENT SITE PHASE I
KHU TẠİ DĨNH CƯ GIAI ĐOẠN I

- KEY
- 1. CHỈ DẪN TÊN ĐƯỜNG
 - 2. CHỈ DẪN TÊN KHU VỰC
 - 3. CHỈ DẪN TÊN ĐƯỜNG
 - 4. CHỈ DẪN TÊN KHU VỰC
 - 5. CHỈ DẪN TÊN ĐƯỜNG
 - 6. CHỈ DẪN TÊN KHU VỰC
 - 7. CHỈ DẪN TÊN ĐƯỜNG
 - 8. CHỈ DẪN TÊN KHU VỰC
 - 9. CHỈ DẪN TÊN ĐƯỜNG
 - 10. CHỈ DẪN TÊN KHU VỰC
 - 11. CHỈ DẪN TÊN ĐƯỜNG
 - 12. CHỈ DẪN TÊN KHU VỰC
 - 13. CHỈ DẪN TÊN ĐƯỜNG
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 - 15. CHỈ DẪN TÊN ĐƯỜNG
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 - 47. CHỈ DẪN TÊN ĐƯỜNG
 - 48. CHỈ DẪN TÊN KHU VỰC
 - 49. CHỈ DẪN TÊN ĐƯỜNG
 - 50. CHỈ DẪN TÊN KHU VỰC

VIỆN KIẾN TRÚC QUY HOẠCH ĐÔ THỊ NÔNG THÔN
SỞ XÂY DỰNG CẦN THƠ
GENERAL LAYOUT OF THE RESETTLEMENT SITE
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DỰ AN NÂNG CẤP ĐÔ THỊ VIỆT NAM - NƠI DỰ AN TP. CẦN THƠ
RESETTLEMENT SITE PHASE I
KHU TẠİ DĨNH CƯ GIAI ĐOẠN I