

EIA

Appendix EIA

1. OBJECTIVES

1.1 Introduction

Fig. 1.1 shows the steps in environmental impact assessment for this study. This study consists of formulation of Master plan for Urban Drainage and Sewerage System for Ho Chi Minh City, the Feasibility Study on Tau Hu Ben Nghe Doi Te Project, and the Detailed Design Study on HCMC Water Environment Improvement Project. The environmental assessment has been carried out in four steps as mentioned below:

- Step 1 Initial Environmental Examination (IEE) and Preparation of Terms of Reference (TOR) for Environmental Impact Assessment Survey for the Priority Project, Tau Hu Ben Nghe Doi Te Project,
- Step 2 Execution of Environmental Surveys on Tau Hu Ben Nghe Doi Te Project,
- Step 3 Environmental Impact Assessment (EIA) on Tau Hu Ben Nghe Doi Te Project,
- Step 4 EIA for the Detailed Design Study on HCMC Water Environment Project.

At Master Plan Stage, Initial Environmental Examination (IEE) was conducted for the priority project to identify major environmental issues, which could be of concern. Table 1.1 briefly explains IEE. TOR for EIA was prepared to examine those issues in detail as per requirements of Vietnamese Laws. EIA was carried out from August – September 1999 and details are reported in Report “Environmental Impact Assessment” prepared by CENTEMA and approved by MOSTE.

EIA for the Detailed Design Study on HCMC Water Environment Project was carried out from November – December 2000 in order to get the further information in addition to the previous study and details are reported in “Environmental Impact Assessment for the Detailed Design on HCMC Water Environment Improvement Project” Report prepared by CENTEMA and approved by MOSTE. Brief summary of the report is presented in this chapter.

1.2 Objectives of the Study

An environmental impact assessment survey shall be carried out in accordance with legal requirements of the Socialist Republic of Viet Nam and Ho Chi Minh City. The objectives of the survey are:

- (a) To identify project activities, particularly those which may cause significant environmental impacts;
- (b) To describe the status of environmental quality in the project area, particularly those features which may experience impact in the future;
- (c) To predict and evaluate the significant environmental impacts whether negative or positive;
- (d) To provide the mitigation measures for preventing, minimizing, and eliminating the environmental impacts; and

- (e) To recommend countermeasures for environmental management and monitoring.

1.3 Project Area

The detailed design study of the phase I consists of:

- Tau Hu - Ben Nghe Canal (Canal improvement of 7.288 km);
- Thanh Da (Pump drainage improvement);
- Ben Me Coc (1) (Pump drainage improvement);
- Ben Me Coc (2) (Drainage improvement);
- Interceptor sewer development (including main and secondary interceptor sewer and diversion chambers);
- Intermediate wastewater-pumping station construction;
- Conveyance sewer construction;
- Wastewater treatment plant construction;

1.4 EIA Report Contents

The following contents should be included in the EIA report for the Detailed Design on HCMC Water Environment Improvement Project in the Socialist Republic of Vietnam - Project Phase 1.

- (1) Introduction;
- (2) Project description with major contents of detailed design;
- (3) Description on existing environmental condition and socio-economic in the project area;
- (4) Assessment of impacts of the projection implementation on environmental quality, socio-economic conditions and living condition of surrounding residential areas:
 - Description of following impact boundary, characteristics and magnitude in comparison with the “no project” scenario:
 - ☐ Air environment;
 - ☐ Water environment;
 - ☐ Soil environment;
 - ☐ Ecosystem;
 - ☐ Infrastructure;
 - ☐ Transportation;
 - ☐ Public health;
 - ☐ Others impacts.
 - Impact evaluation of project option alternative;
 - Overall evaluation (impact assessment);
- (5) Mitigation measures of negative impacts;
- (6) Proposing environmental quality monitoring program;
- (7) Conclusions and recommendations.

1.5 Organization, Participants and Implementation Method

The EIA report for “the Detailed Design Study on HCMC Water Environment Improvement Project” has been made by Center for Environmental Technology and Management - CENTEMA, Van Lang University, Ho Chi Minh city with the participation of an expert group of high experience in establishing EIA report.

The process of EIA report composition includes the following steps:

- Collecting necessary additional data and documents, and reviewing the previous EIA Report: environmental natural conditions, socio-economy, pre-feasibility report and several other documents related to the Project as well as to the construction area.
- Making additional survey on the status of environmental elements by standard methods at the project area, especially around the new proposed Wastewater Treatment Site.
- Based on the result of the former steps, impact assessment of the Project on environmental, socio-economic factors has been carried out.
- Recommend general measures based on scientific and practical foundations to minimize and limit the negative impacts in order to protect the environment.
- Compose the EIA report and defend it in front of EIA report appraisal committee of Government grade or local grade according to recent regulation of Ministry of Science, Technology and Environment.

Participants in this EIA study are:

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2. Law and Regulation

2.1 Vietnamese Laws and Requirement for EIA

Environmental concerns and developments of environmental legislation and policies in Vietnam began in the early 1990s. The National Assembly of the Socialist Republic of Vietnam, at its 4th session of the IX Legislature, passed the Environmental Protection Law (EPL) on 27 December 1993. Subsequently, the decree No. 175-CP was issued on the 18th October 1994 to provide guidance for the implementation of the Law on Environmental Protection. Additionally, Circular No.490/1998/TT-BKHCMNT issued on April 29, 1998 by Ministry of Science, Technology and Environment in guidance on

making and appraisal of Environmental Impact Assessment Report for investment project. This specifies the requirements of an EIA at different stages of the project development. For the detail design study, it is required to conduct EIA report following the standard as presented in Appendix I.2 of the Government Decree No. 175/CP. The specific chapters include introduction, brief description of the project, environmental status of the project areas, impacts of the project implementation to the environmental and natural resources factors, and recommendations on the alternative for project implementation.

The EIA report for the Phase 1 Detail Design Study on “Ho Chi Minh City Water Environment Improvement Project” is made based on the following legal foundations:

- Circular No 490/1998/TT-BKHCNMT issued on April 29, 1998 by Ministry of Science, Technology and Environment in guidance on making and appraisal of Environmental Impact Assessment report for investment projects. This circular replaces the circular 1100/TT-MTg promulgated by MOSTE on 20th August 1997.
- Government Decree 175/CP issued on October 18, 1994 by the Government, in guidance on implementation of Environmental Protection Law.
- Introduction No. 1420-MTg issued on 26 December 1994 by MOSTE, guiding environmental impact assessment to the operating units.
- Decision No. 1806/QD-MTg issued by MOSTE on 31 December 1994, on promulgation of the regulation and organization of appraisal council on EIA and issuing environmental license.
- Decision No. 1807/QD-MTg issued by MOSTE on 31 December 1994, indicates regulation and organization of appraisal council on EIA report and issuing environmental license.
- Decree No. 26/CP issued by the Government on 26 April 1996, providing regulations on the punishment of administrative violation of environmental protection.
- Environmental Protection Law dated December 27, 1993 by the Parliament of the Socialist Republic of Vietnam.
- Foreign Investment Law in Vietnam stipulated on November 12, 1996 (modified from 1987, 1990, 1992 version).
- Decree No 12/CP issued on February 18, 1997 by the Government, promulgating detailed regulations on implementation of Foreign Investment Law in Vietnam.

2.2 Environmental Standards

All investment projects to be implemented within the territory of Vietnam shall have to apply Vietnamese Environmental Standards issued by the Ministry of Science, Technology and Environment. Those projects to be implemented at provinces where local environmental standards is available, may be adopted, provided that such local standards must be more stringent than those standards issued by MOSTE.

In case that other environmental standards required are not stipulated by the Vietnamese Environmental Standards, the proponents may apply to adopt a set of or any standards developed by other advanced countries provided that the adoption is subject to the permit in writing granted by MOSTE.

3. DESCRIPTION OF THE PROJECT PHASE 1

3.1 Project phasing

The priority project will be implemented through two phases, phase I and phase II, as follows:

- Phase 1 (2000 – 2005): along with the detailed design works of the basic structures relating to this phase to be started firstly, the subjected construction works and the related institution program will be orderly carried out.
- Phase 2 (2006 – 2010): all the rest of the priority project, the expanded works in the phase II, and prolonged institution programs, will be carried out to achieve completely all components envisaged in the priority project by the end of 2010.

3.2 Implementation program for phase 1 project

The phase 1 project consisting of detailed design and construction will be implemented within 70 months, from March 2000 to December 2005. The detailed design will be accomplished within 13 months between March 2000 to March 2001. The pre-qualification and tendering of contractor will be done within 6 months from April 2001 to September 2001. The construction works will be conducted within 51 months from October 2001 to December 2005.

The detailed design study of the phase I consists of:

- Tau Hu - Ben Nghe Canal improvement of 7.288 km: Sediments at the bottom will be dredged to increase the conveyance capacity and embankment will be constructed to improve the city environment:
 - Ben Nghe Canal: 3,158 m
 - Tau Hu Canal: 4,076 m;
- Pump drainage improvement at Thanh Da: Improvement of pump drainage system at Thanh Da consist of storage tank construction, pump and drainage pipe installation, and concrete pile revetment construction;
 - Drainage area: 15.4 ha
 - Pump capacity: 42 m³/min
 - Concrete pile revetment: 75 m
 - Drainage pipe: 680 m (φ 800 mm - φ 1,200 mm)
- Pump drainage improvement at Ben Me Coc (1): Improvement of pump drainage system at Ben Me Coc (1) consists of storage tank, pump and drainage pipe installation, and temporary earth dike construction;
 - Drainage area: 70.9 ha
 - Pump capacity: 42 m³/min
 - Temporary earth dike: 3,950 m
 - Drainage pipe: 4,620 m (φ 900 mm – φ 1,800 mm)
- Pump drainage improvement at Ben Me Coc (2): Improvement of Ben Me Coc (2) drainage system consists of drainage pipe installation and temporary earth dike construction;
 - Ben Me Coc (II) area: 46.0 ha
 - Temporary earth dike: 3,300 m;
 - Drainage pipe: 4,190 m (φ 600 mm – φ 2,000 mm)
- Existing Combined Sewer Improvement
 - Additional: 6,530 m (φ1,000 mm - €2,500 mm x 2,000 mm)
 - Replace: 3,182 m (€2,000 mm x 2,000 mm, €2,500 mm x 2,500 mm)

- Interceptor sewer (including main and secondary interceptor sewer and diversion chambers);
 - Main: 5,548 m (ϕ 300 mm - ϕ 1,500 mm)
 - Secondary: 7,013 m (ϕ 300 mm - ϕ 1,200 mm)
 - Diversion Chamber: 32 units
- Intermediate wastewater-pumping station;
 - 66.7 m³/min x 3 units (1 units for standby)
- Conveyance sewer; and
 - ϕ 1,500 mm x 398 (shield)
 - ϕ 2,000 mm x 648 (shield)
 - ϕ 1,200 mm x 2,000 mm x 3,070 m (trench)
- Wastewater treatment plant (including inflow pump, primary sedimentation basin, aeration tank, secondary sedimentation basin, disinfection tank, gravity thickener, dewatering, and composting plant).
 - Wastewater treatment
 - Inflow pump:* 66.7 m³/min x 14.5 m x 30 Kw x 3 units (1 unit standby)
 - Primary sedimentation basin:* 7 m (W) x 13 m (L) x 3 m (D) x 20 units with flight chain type sludge collector.
 - Aeration tank:* 10.5 m (W) x 28 m (L) x 5.5 m (D) x 10 units with blower of 600 m³/min x 6.0 m(Aq) x 750 kw x 3 units (1 units standby).
 - Final sedimentation basin:* 5 m (W) x 26 m (L) x 3.5 m (D) x 40 units with flight chain type sludge collector.
 - Disinfecting tank:* 5 m (W) x 28 m (L) x 5 m (D) x 4 with sodium chlorine tank of 13 m² x 2 units.
 - Gravity Thickener:* ϕ 14 m x 3 m (h) x 1 unit
 - Sludge dewatering:* Centrifugal type with capacity of 30 m³/h x 2 units (1 unit standby)
 - Composting plant:* Capacity of 106 m³/d, mixer of 3 m depth with blower of 18 m³/min x 4 m(Aq) x 2 units.

4. Significant Environmental Impact

The proposed project will result in improvement of living environment, public health benefits and abatement of pollution to rivers and groundwater. Improper planning and engineering design and the use of inappropriate construction techniques/methods and equipment can be counterproductive and lead to serious negative short term and long term impacts. Potential and significant environmental impacts, both positive and negative are identified and assessed for

- a) the pre-construction stage,
- b) the construction stage, and
- c) operation stage.

Table 4.1 shows the impact matrix for impacts extracted in previous EIA study.

4.1 Sources Of Environmental Pollution And Public Health Impact

4.1.1 Tau Hu-Ben Nghe Canal Improvement Activities

(1) Construction Stage

a. Water Pollution

- Dredging of sediment from Tau Hu- Ben Nghe canal
 - ☐ Affecting on water flow;
 - ☐ Surface water quality degradation due to suspension of sediment;
 - ☐ Dissolving heavy metals from dredged sludge into surface water;
 - ☐ Oil and grease release to canal from dredging equipment;
 - ☐ Sewage sludge from sewer release to canal.
- Storage and transportation of sediment
 - ☐ Surface water quality degradation due to overflow and run off carrying organic pollutants;
 - ☐ Surface water quality degradation due to overflow and run off carrying heavy metals.
- Disposal of sediment
 - ☐ Organic contamination of underground water from disposed sediment at dumping site;
 - ☐ Heavy metals contamination of underground water from disposed sediment at dumping site;
 - ☐ Run off carry out organic pollutant offsite and degrade at adjacent receiving water bodies;
 - ☐ Run off carry heavy metals offsite and degrade at adjacent receiving water bodies.

b. Air Pollution, Noise and Vibration

- Dredging of sediment and improvement of Tau Hu- Ben Nghe canal
 - ☐ Noise emits from dredging equipment;
 - ☐ Odor releases from sediment;
 - ☐ Noise emits from slope protection and revetment construction;
 - ☐ Polluted air exhausts from construction vehicles and equipment.
- Odor releases from collected sediment during storage and transportation.
- Odor releases from dumping site.

c. Soil Pollution

- Soil contamination by heavy metals and organic matters containing in sediment at disposal site, if it is not well controlled;
- Soil contamination by pathogen containing in sediment at disposal site, if it is not well controlled.

d. Impacts on Ecosystem

- Affecting on bottom creatures, fishes and shrimps;
- Affecting on flora growing along and in the canal;
- Erosion the canal banks.

e. Other Impacts

- Construction accidents;
- Decreasing traffic activities in canal during dredging;
- Traffic accidents during transportation of dredged sludge;
- Inappropriate disposal of sediment can cause public health risk;
- Affecting on landscape after improving of Tau Hu – Ben Nghe canal.

4.1.2 Drainage Pumping Station Improvement at Thanh Da, Ben Me Coc 1, & Ben Me Coc 2

(1) Construction Phase

a. Water Pollution

- Surface water contamination due to construction activities of temporary earth dike, retarding pond, pump station, and drainage pipe as well as transportation of construction materials;
- Domestic wastewater from temporary houses of construction workers, especially at pumping station site.

b. Air Pollution

- Construction of dike
 - ☐ Dust emits from dike excavation;
 - ☐ Polluted air emits from construction equipment and vehicles;
 - ☐ Noise emits from construction activities and equipment.
- Drainage piping
 - ☐ Excavation of trench emits substantial amount of fugitive dust particles (FDPs);
 - ☐ Onsite storage of spoil and fill materials also emits large amount of FDPs;
 - ☐ Breaking of pavement also causes FDPs;
 - ☐ Polluted air including NO_x, SO₂, CO, CO₂, hydrocarbon emission from construction vehicles and equipment;
 - ☐ Noise pollution from construction equipment and vehicles.
- Construction of pump station, control gate and retarding pond (as presented above).

c. Soil Pollution

- Excess spoil from construction works;
- Domestic solid wastes from construction workers' temporary houses.

d. Other Impacts

- Increase traffic congestion and high risk of accidents;
- Noise from breaking of pavement/floor activities can cause occupational disease;
- Trench left open over-night without proper warning signs can causes public health risk and safety;
- Air, dust, and FDPs emission cause severe public health risk.

(2) Operation Stage



- a. Other impacts
 - Noise emits from pumps, generators and other equipment.

4.1.3 Existing Combined Sewer Improvement

(1) Construction Stage

- a. Water Pollution
 - Canal water pollution, where receiving wastes from proposed improved sewers.
- b. Air Pollution
 - Polluted air emits from construction equipment and vehicles;
 - Excavation of trench emits substantial amount of fugitive dust particles (FDPs);
 - Onsite storage of spoil and fill materials also emits large amount of FDPs;
 - Breaking of pavement also causes FDPs;
 - Noise pollution from construction equipment and vehicles;
 - Odor releases from sewage and sludge.
- c. Soil Pollution
 - Excess spoil from construction works.
- d. Other Impacts
 - High exposure to occupational health hazard if workers do not follow strict safety procedure and precaution before entering sewer/manholes;
 - Rehabilitation of existing sewers can cause local flooding if temporary drainage diversion is not in place;
 - Noise from breaking of pavement/floor activities can cause occupational disease;
 - Trench left open over-night without proper warning signs can causes public health risk and safety;
 - Air, dust, and FDPs emission cause severe public health risk;
 - Increase traffic congestion and high risk of accidents;
 - Sewage and sludge contain pathogens at high concentration and other toxic materials including crushed glasses which are potential risk for workers during installing of sewers;
 - It is high potential for workers to inhale available toxic gases releasing from sewers;
 - Local business affecting.

4.1.4 Interceptor Sewer Construction

(1) Construction Phase

- a. Air Pollution
 - Polluted air including NO_x, SO₂, CO, CO₂, hydrocarbon emission from

- construction vehicles and equipment;
- Excavation of trench emits substantial amount of fugitive dust particles (FDPs);
- Onsite storage of spoil and fill materials emits large amount of FDPs;
- Breaking of pavement also causes FDPs emissions;
- Breaking of pavement emits high level of noise from the compressor and the impact of cutting tool on pavement;
- Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise.
- b. Soil Pollution
 - Excess spoil from construction works.
- c. Other Impacts
 - Traffic congestion and high risk of accidents;
 - High exposure to occupational health hazard if workers do not follow strict safety procedure and precaution before entering of sewers;
 - Trench left open over-night without proper warning signs can cause public health risk and safety;
 - Construction of existing sewers can cause local flooding if temporary drainage diversion is not in place;
 - Local ecosystem affecting.

4.1.5 Construction and Operation of Intermediate Wastewater Pumping Station

(1) Construction Stage

- a. Air Pollution
 - Polluted air including NO_x, SO₂, CO, CO₂, hydrocarbon emission from construction vehicles and equipment;
 - FDPs emit during clearing/grading/preparation of site;
 - FDPs emit from earthwork activities, excavation and filling;
 - Onsite storage of spoil and fill materials emits large amount of FDPs;
 - Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise.
- b. Soil Pollution
 - Excess spoil from construction workers;
 - Solid wastes from construction workers' temporary houses.
- c. Other Impacts
 - Effecting on local residential living conditions;
 - ☐ Temporary disruption of water supply due to installation of water supply system to the plant;
 - ☐ Temporary power outage during electrical installation of power supply to the plant;
 - ☐ Temporary disruption of telephone services during construction;
 - ☐ Temporary diversion of drainage flow might cause local flooding

problem.

(2) Operation Stage

- a. Affecting on environmental quality during operation of intermediate wastewater pumping station (IWPS)
 - Noise emits from pumps, generators and other equipment;
 - Solid wastes generation from screens system;
 - Odor release from biodegradation of sewage organic matters.
- b. Ecosystem and landscape Affecting.

4.1.6 Conveyance Sewer Construction

(1) Construction Stage

- a. Air Pollution
 - Polluted air including NO_x, SO₂, CO, CO₂, hydrocarbon emission from construction vehicles and equipment;
 - FDPs emit during clearing/grading/preparation of site;
 - FDPs emit from earthwork activities, excavation and filling;
 - Onsite storage of spoil and fill materials emits large amount of FDPs;
 - Breaking of pavement also causes FDPs emissions;
 - Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise.
- b. Other Impacts
 - High exposure to occupational health hazard if workers do not follow strict safety procedure and precaution before entering of sewers;
 - Noise pollution and traffic congestion increasing;
 - Local ecosystem affecting.

4.1.7 Construction and Operation of Wastewater Treatment Plant

(1) Construction Stage

- a. Water Pollution
 - Silting of soil materials (from spoil and fill materials stored on site) at adjacent water bodies due to runoff;
 - Surface water contamination by oil spills from construction vehicles and equipment;
 - Domestic wastewater from construction workers' temporary houses
- b. Air pollution
 - Polluted air including NO_x, SO₂, CO, CO₂, hydrocarbon emission from construction vehicles and equipment;
 - FDPs emit during clearing/grading/preparation of site;

- FDPs emit from earthwork activities, excavation and filling;
- Onsite storage of spoil and fill materials emits large amount of FDPs;
- Breaking of pavement also causes FDPs emissions;
- Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise.
- c. Soil Pollution
 - Solid wastes generate from clearance work;
 - Solid wastes from construction workers' temporary houses.
- d. Other impacts
 - Affecting on waterway transportation;
 - Affecting on local ecosystem.

(2) During operation stage

- a. Water Pollution
 - Affecting on Tau Hu-Ben Nghe canal water quality;
 - Affecting on Tac Ben Ro water quality, the receiving of effluent from wastewater treatment plant.
- b. Air Pollution
 - Polluted air emits from biodegradation of organic matters from biological treatment process;
 - Polluted air emits from biodegradation of sludge from composting plant.
- c. Soil Pollution
 - Sludge from wastewater treatment plant;
 - Solid wastes from operators' houses.

4.2 SOURCES OF SOCIO-ECONOMIC IMPACTS

(1) Pre-Construction Stage

- a. Relocation and Resettlement
 - Affecting on living condition of residents who are living on and along Tau Hu – Ben Nghe canal, in proposed construction sites of drainage pump station and dikes in Thanh Da, Ben Me Coc 1 and Ben Me Coc 2, in proposed construction site of intermediate wastewater pumping station, and wastewater treatment plant due to relocation – clearance – resettlement activities.

(2) Construction Stage

- a. Impacts
 - Local business affecting;
 - Traffic affecting and high risk of accidents; and
 - Creating thousands of jobs in the construction stage.

(3) Operation Stage

Benefits

- The urban environmental quality of Tau Hu – Ben Nghe basin, and related canal systems will be improved and enhanced with the construction of sewer systems, a wastewater treatment plant, and dredging of sediment from canal system.
- Draining sewers, and draining pumping stations can solve mostly flooding problems in the project areas. This is the important success of the project with the following specifications:
 - ☐ Overcoming flooding problems at many places in the city;
 - ☐ Saving tens of billions Viet Nam Dong each year due to flooding;
 - ☐ Saving hundreds of billions Viet Nam Dong which are required for maintenance, repairing of equipment, public infrastructure broken by flooding; and
 - ☐ Significant contribution to create residential trust in sharing environmental protection fee with the City and Government.
- The improvement of Tau Hu – Ben Nghe Canal will enhance the canal transportation..

5. Pollution Prevention And Mitigation Measures

In order to minimize negative impacts and enhance positive impacts to environmental quality, socio-economic condition caused by the activities of the project phase 1, technical, engineering and management measures applied are suggested in Section 5. With many different construction items and impacts from construction and operation activities as presented in Section 4, Section 5 aims to describe common feasible measures to prevent and mitigate environmental pollution for similar activities during pre-construction, construction and operation stages of the project phase 1.

5.1 Technical Mitigation Measures

5.1.1 Water Environment Pollution Prevention and Mitigation

(1) Mitigation of Impacts During Canal Sludge Dredging

During the dredging, sediments messing and spilling when moving from canal bottom to the barge causes water pollution. Technically, this pollution source can be prevented using the following measures:

- At possible locations (existing street, narrow width of canal), employing excavator, shovel scurf to dredge the supernatant nearby the shore during low tide;
- Employing as tight container as possible to avoid the spilling of water on the street during transportation.

During the dredge, on the way from canal bottom to barge, some sediment is spilled and dissolved into canal water and causes high color and suspended solid concentration. This sediment will be partly settled at downstream of the flow. The settle location depends on the flow direction and velocity. If the velocity and water level is high, sediments will be carried further than the case of low velocity and water level. The spilling and settling of sediments decreases the dredging efficiency. In order to overcome those obstacles, the dredging procedure should be done with considering flow direction and flow rate.

Canal Sludge disposal sites with EIA approved by DOSTE are prepared in Can Gio and Nha Be districts by Waterway Management Office. Canal sludge produced from the project will be disposed into the above disposal sites with following Waterway Management Office's instruction in order to reduce the contamination of water and soil.

(2) Mitigation of Impacts During Construction Stage

- a. Mitigation of impacts from water that is pumped out from construction pits during the period of execution.

For the amount of water to be pumped out from construction pits during the execution of sewerage, components of sewerage system, pumping station and wastewater treatment plant, it is unallowable to pump directly into sewerage system or water resources. In case of no other alternatives, it is better to provide big dikes to hold runoff and to settle out suspended solids before pumping into the receiving water.

- b. Treatment of domestic wastewater.

In order to ensure environmental quality of workers and surrounding residents, during the period of execution, contractor has to construct the public toilets for pretreatment. One of the most suitable one is a septic tank, which is similarly to Jousako septic tank from Japan and available in Vietnam with reasonable cost. After finishing, execution team has to clean this area and remove all the public toilets.

(3) Mitigation of Impacts During Operation Stage

During operation after 2010, there are about 469,000 m³ of treated wastewater to be discharged into Tac Ben Ro canal. This kind of wastewater is treated to meet B Standard with COD ≤ 100 mg/L and BOD₅ ≤ 50 mg/L. Now all of untreated wastewater was discharged directly into Tau Hu- Ben Nghe canal through about 40 outlets along Tau Hu-Ben Nghe canal. When wastewater treatment plant is operated, this wastewater is treated and is discharged from one outlet. This situation may impact to water environment. This area is influenced by semi-tide, and discharged wastewater may not be diluted effectively and may be stagnated, which may affect on water environment during short period (10-15 min.) As standard and Environmental Law, after treating to meet B standard, treated wastewater is allowed to discharge into surface water resource. But if considering the sensitive of the environment, the self purification of water

resource should be considered carefully. This problem may be solved by some following technical measures:

- Installing an outlet far from the shore to increase the dilution capacity of water resource to treated wastewater;
- Installing an outlet submersing into water existing flow in settlement zones;
- Installing two to three outlets in the distance of at least 500 m (as far as possible) to avoid discharging treated wastewater into no-flow water position.
- Treating the wastewater more completely.

At present,

- The present design in phase 1 (2005) has one outlet and there is normally existing underflow in settlement zones of treated wastewater from an outlet;
- Result of canal water flow survey showed that total flow of one direction of Tac Ben Ro Canal is about 100 m³/s. Treated wastewater flow rate during phase 1 is 141,000 m³/day or 1.6 m³/s.
- Multiple outlets need the higher construction and maintenance cost than the present design, and also need more land acquisition or hamper the effective use of land.

Monitoring or other study in operation stage of phase 1 (or in detailed design study of the phase 2) will clarify the effectiveness and problems for one outlet system in the phase 1 and will show the best method in both environmental and economic aspects for the phase 2, where discharged volume of treated wastewater will be 469,000 m³/day, 5.4 m³/s or three times more than in the phase 1.

5.1.2 Air Environmental Pollution Prevention And Mitigation

(1) Mitigation of Foul Odor from Dredging Sediments

Organic matters of sediment that have stayed for a long time at canal bottom in anaerobic condition generates foul odor. The adverse impacts from this pollution source can be treated using 1 liter of effective microorganism (EM) per 1000 kg of sediments. EM has been applied for solid waste and wastewater successfully.

(2) Mitigation of Impacts from Exhaust Gas of Mobile Vehicles, Construction Vehicles and Equipment

The major air pollutants emitted from construction activities are carbon monoxide (CO), gas hydrocarbon and fugitive dust particles. These can be generated from construction equipment and transportation vehicles. CO is the only pollutant to be considered potentially hazardous to human health. Gaseous hydrocarbons and nitrogen oxides are not considered harmful at concentration found even in the most heavily traffic urban area. Pollution can be mitigated by:

- Appropriate planning and scheduling of construction activities to minimize traffic diversion and congestion;
- Delivery of construction materials (raw materials, earth, spoils, concrete, etc.,) should be performed during off-peak hours to avoid traffic congestion.
- Low emission construction vehicles should be used whenever possible;
- Trucks carrying raw materials, earth, spoils that emit high fugitive dust should be covered while in motion;
- All the stationary equipment should be located as far away as practical from receptor locations to allow dispersion of emitted pollutants;

(3) Mitigation of Impacts from Noise and Dust

The following mitigation measures can be applied to mitigate noise, vibration and dust pollution:

- Use special vehicles and construction equipment that emit low level of noise and vibration;
- Scheduling construction so that the unavoidable vibration occurs during hours when occupancy of building is low;
- Restricting the use of high vibration construction equipment to very short operation hours per day;
- Minimizing the use of many vibration and noise –causing pieces of equipment at any one time;
- Informing residents the expected duration of particular noise activities to minimize complaints;
- Watering the area of execution to reduce the emission of dust.

(4) Mitigation of Exhaust Gas From Pumping Station and Wastewater Treatment Plant

Exhaust gas generating from pumping station due to biodegradation of organic matters existing in wastewater and part of waste at screeners. This amount of waste is difficult to collect for treatment. Therefore, it is better to solve by good ventilation so that the workers and surrounding residential area will not be directly impacted.

Exhaust gas coming from wastewater treatment plant due to the bio-degradation process is not much so that it is not necessary to treat. Foul odor can be removed using EM. It is also possible to provide good ventilation to mitigate against odor problems.

5.1.3 Soil Environmental Pollution Prevention And Mitigation

(1) Solutions for Surplus Soil and Concrete Waste Treatment

As presented in the previous chapters, amount of surplus soil and concrete waste generating during construction of Tau Hu-Ben Nghe embankment, pump drainage improvement at Thanh Da, Ben Me Coc 1 and Ben Me Coc 2, intermediate wastewater

pumping station, and wastewater treatment plant of the project phase 1 is estimated of about 250,000 m³. This surplus generation can cause adverse impacts due to releasing a lot of dust during digging, transporting and disposing. Besides, if it is dumped in agricultural region, a big area of about 10 - 15 ha will be lost. However, this is a very good ground level material. It is well known that there are many flood-prone areas throughout Ho Chi Minh City. During rainy season and high tide, localized floods lasting 1-2 days are reported more than 50 flood-prone areas (such as District 8, 2, Binh Thanh, etc.). In order to overcome this problem, increasing of ground level up to a certain level is one of suitable alternatives. Sand, which is explored from rivers, is the most popular ground level material. However, with high demand of the ground level material (about 2,000,000 m³), rash and unplanned exploration is not able to avoid and resulting heavy affects the aquatic ecosystem, landslide of canal shore, changing of the flow direction, etc.,... Therefore, the reuse of assess spoil as the ground level material will give many benefits such as saving the fee of sand exploration, resources and environmental conservation, monitoring the traffic density of waterway. However, in order to apply in ground level purpose at right place and following the city planning, the project will cooperate with other judicial organizations before implementing.

(2) Construction Waste Treatment

Adequate provision of appropriate management of construction debris is essential to avoid degradation of water quality of the receiving water bodies. Similarly to excess soil, 5,000 m³ of construction waste generate from dismantling, destroying houses and the other buildings for clearing as well as from about 3,000 m of replaced sewer can be used for ground level purpose. Regarding to the labor safety, transportation vehicles should be adequately covered to prevent dust emission, spillage of materials and risk of accident.

(3) Treatment of Dredging Sediments

It is estimated about 690,000 m³ of sediment generated from dredging of Tau Hu-Ben Nghe during phase 1, of which about 350,000 m³ will be dredged by Waterway Management Office. This sludge containing organic matter, even toxic organic compounds such as PCBs, pesticides, and heavy metals, etc. Therefore, it causes plenty of public opinions whenever is planned to dump this kind of waste. However, results of survey indicates that the sediment is satisfy to treat by following alternatives:

- Treatment and disposing as municipal solid waste;
- Use as the ground level material;
- Disposal on land or using as raw material for composting.

If the dredging sediments is intended to disposing on land or as composting raw material, it is necessary to apply all relevant technical conditions to removal pathogens as well as heavy metals, which are over the permit concentration for applying on land.

(4) Treatment of Municipal Solid Waste

Municipal solid waste from temporary households at construction sites as well as from worker's houses and offices during operation phase are all collected and disposed as municipal solid waste following local regulation.

Besides, solid waste from screening and grit chamber system (about 4 tons/day) at pumping station is washed with water, collected and disposed as municipal solid waste.

(5) Treatment of Sludge from Wastewater Treatment Plant

Sludge generating from wastewater treatment plant (about 106 tons/day, 80%) is proposed to treat by the following two options:

- Sludge generated is composted at wastewater treatment plant before sending to HCMC Waste Disposal Company (HOWADICO) for dumping to municipal landfill (23 tons/day, moisture content of 59%) as regulation.
- Dewatered sludge (moisture content of 80%) may be sent directly to HOWADICO for composting before dumping in municipal landfill if HOWADICO's project will be available.

In all cases, the sludge generating from wastewater treatment plant will be disposed in compost form to the domestic waste disposal sites of HOWADICO.

5.1.4 Mitigation Measures of Socio-Economic Impacts

(1) Mitigation of Traffic Density

The project activities will contribute to considerable increasing of truck density and cause traffic jam. Therefore, in order to avoid traffic obstructing, it is try to apply appropriate planning and scheduling of construction activities to minimize traffic diversions and congestion even in waterway. Construction activities are planned not to conduct during rush hours. Traffic density on construction roads is also limited to minimize accidents between construction vehicles and traffic vehicles. For waterway transportation, it is required to transportation guidance for sludge barges and sufficient lighting, especially at night in order to avoid hitting against other barges and boats or against bridge.

(2) Mitigation of Noise and Vibration

Uncontrolled excessive vibration and noise can cause discomfort to people and severe structural damage to existing buildings. In order to mitigate these affects, the following measures can be applied:

- Using appropriate construction techniques that emit low level of vibration;
- Plan construction period to minimize duration of high noise exposure;
- Use of quietest equipment that is economically suited for construction use;
- Try to meet guaranteed levels of maximum noise exposure levels.

(3) Transportation Safety During Construction

When vehicles are going and coming on a construction site, the potential for errant movement, changes in traffic patterns and workers getting in the pathway can always occur, therefore, the following regulations should be applied to minimize the accidents:

- All vehicle or heavy equipment operators must obey all traffic signs and posted speeds;
- All loads are to be secured properly and hauled material that overhangs the sides or ends of truck are to be marked;
- Workers are never to ride running boards, fenders, side rails, tailgates, or tops of vehicles;
- Workers are not to extend any part of their body outside of a truck bed, or stand in it while moving;
- With the movement of vehicular traffic by those who are delivering and removing materials to and from the site, the heavy equipment operators may experience blind spots, therefore, workers themselves must be alert and take precautions to protect themselves from being struck by vehicles and equipment.

(4) Mitigation Measures for Excavation Safety

All surface encumbrances, that are located so as to create a hazard to employees, are to be removed or supported, as necessary, to safeguard employees (referred from Handbook of OSHA construction Safety and Health, Charles D. Reese and James V. Eidson, Lewis Publishers (1999)).

a. Egress Ramps and Runways

- Structural ramps, which are used solely by employees as a means of access or egress from excavations, are to be designed by a competent person.
- Cleats or other appropriate means used to connect runway structural members, are to be attached to the bottom of the runway, or attached in manner to prevent tripping.
- Structural ramps, used in lieu of steps, must provide cleats or other surface treatments on the top surface to prevent slipping.
- A stairway, ladder, ramp, or other safe means of egress must be located in trench excavations that are 1.2 meters or more in depth so as to require no more than 7.5 meters of lateral travel for employees.

b. Equipment and Loads

- No worker is permitted underneath loads handled by lifting or digging equipment. To avoid being struck by any spillage or falling materials, employees are required to stand away from any vehicle being loaded or unloaded. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped to provide adequate protection for the operator during loading and unloading operations.
- When mobile equipment is operated adjacent to an excavation or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system is to be utilized. These systems can be such things as barricades, hand or mechanical signals, or stop logs.

c. Hazardous Atmosphere

To prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirement apply:

- The atmosphere in the excavation is to be tested before employees enter excavations greater than 1.2 m in depth.
- Adequate precautions must be taken to prevent employee exposure to atmospheres containing less than 19.5 % oxy and other hazardous atmospheres.
- Adequate precaution is to be taken, such as providing ventilation to prevent employee exposure to the atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.
- When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remain safe.
- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, must be readily available where hazardous atmospheric conditions exist, or may reasonably be expected to develop during work in an excavation. This equipment must be attended when in use.
- Employees entering bell-bottom pier hole, or other similar deep and confined footing excavations, must wear a harness with a lifeline securely attached to it. The lifeline is to be separate from any line used to handle materials, and is to be individually attended at all times while the employee, wearing the lifeline, is in the excavation.

d. Water accumulation

- Employees are not to work in excavation in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to adequately protect employees vary with each situation, but could include special support or shield system to protect from cave-ins, water removal to control the level of accumulating water, or the use of a safety harness and lifeline.
- If water is controlled, or prevented from accumulating by using water removal equipment, the water removal equipment and operations are to be monitored by a competent person to ensure proper operation.
- If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means are to be used to prevent surface water from entering the excavation. Adequate drainage of the area adjacent to the excavation must also be provided. Excavations subject to runoff from heavy rains are required to be inspected by a competent person.

e. Below Level Excavations

Where the stability of adjoining building, walls, or other structure are endangered by excavation operations, support systems as shoring, bracing, or underpinning must be provided for the protection of the employees and to ensure the stability if such structures exist. Excavation below the level of the base, or footing of any foundation, or retaining walls that could be reasonably expected to pose a hazard to employees, must not be permitted except when:



- A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure.
 - The excavation is in stable rock.
 - A registered professional engineer has approved and determined that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity.
 - A registered professional engineer has approved and determined that such excavation work will not pose a hazard to employees.
 - Sidewalks, pavements and appurtenant structures are not to be undermined unless a support system or other method of protection is provided to protect employees from the possible collapse of such structures.
- f. Loose Materials
- Adequate protection must be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection consists of scaling to remove loose material; installation of protective barricades at intervals, as necessary on the face, to stop and contain falling material; or other means that provide equivalent protection.
 - Employees are to be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavation. Protection shall be provided by placing and keeping such materials or equipment at least 0.6 m from the edge of excavations, by using retaining devices that sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both, if necessary.
- g. Inspections
- Daily inspections of excavations, the adjacent areas, and protective systems must be made by a competent person for any evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions.
 - An inspection is to be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard, which may increase the occurrence of a hazardous condition.
- h. Walkways and Barriers
- Walkways are to be provided where employees or equipment are required, or permitted to cross over excavations. Guardrails need to be provided where walkways are 1.8 m or more.
 - Adequate physical barrier protection must be provided at all remotely located excavations. All wells, pits, shafts, etc. must be barricaded or covered. As completion of the work, temporary wells, pits, shafts, etc. are to be backfilled.

(5) Working Safety in Confined Spaces

In an effort to prevent injury or death when working in confined spaces, the contractor should implement and enforce the following safe work procedures (referred from Handbook of OSHA construction Safety and Health, Charles D. Reese and James V. Eidson, Lewis Publishers (1999)):

- A hazard evaluation must be conducted before any work is started in confined space.

- Technically competent personnel must test the atmosphere within the confined space with an appropriate gas detector and approved oxygen testing equipment before employees enter.
- If combustible gases are detected, employees are prohibited from entering the confined space until the source has been isolated and the space flushed or purged to less than 10% of the lower explosive limit.
- If an oxygen deficient atmosphere (less than 19.5% by volume) is present, positive ventilation techniques, including fans and blowers, may be used to increase the oxygen content. If further testing indicates the atmosphere is still oxygen deficient, self-contained breathing apparatus or other air supplied respiratory protection will be provided.
- When toxic or chemical materials are detected or suspected, the following actions should be taken:
 - ☐ Any piping that carries or may carry hazardous materials to the confined space, will be isolated.
 - ☐ Empty the hazardous substance from the space until safe limits are reached.
 - ☐ Provided adequate ventilation and personal protective equipment for the eyes, face and arms, if welding, burning, cutting or heating operations, which may generate toxic fumes and gases are performed.
 - ☐ Employees must wear eye and other appropriate protective equipment to prevent possible contact with corrosive materials.
- An emergency plan of action that provides alternative life support systems and a means of escape from confined spaces must be developed and communicated to all employees engaged in work in confined spaces.
- For evacuation purposes, each employee entering a confined space should wear a safety belt equipped a lifeline, in case of an emergency.
- Emergency equipment (e.g. lifelines, safety harness, fire extinguishers, breathing equipment, etc.) appropriate for the situation should be ready and immediately available.
- All persons engaged in the confined space activity must receive training in the use of the life support system, rescue system, and emergency equipment.
- An attendant, trained in first aid and respiration, must remain outside the entrance to the confined space. The attendant must be ready to provide assistance, if needed, by utilizing a planned and immediately available, communications means (radio, hand signals, whistle, etc.). The attendant should never enter the confined space in an attempt to rescue workers until additional rescue team personnel have arrived.

(6) Underground Construction Safety

Construction tunnels underground pose the same construction hazards as aboveground. There are also some added problems, the least of which are:

- More confining environment with less space;
- Lack of stability of the rocks or materials on all sides.

The following mitigation measures can be applied:

- Workers must be alert for loose soil, rock, or fractured materials, these should be removed or properly supported.
- Workers are to be alert to moving equipment, especially around loading and hauling equipment.
- During underground, construction workers should never work alone. They must be alert to hazards and get help to correct them.
- Workers need to wear their personal protective equipment, such as eye protection from flying objects, lasers, or other eye hazards.
- Since the underground operations do not have adequate ventilation, a special effort must be made to ensure that the ventilation is adequate at all times.
- Dust should be controlled during such operations as drilling and lighting must be adequate in underground operations.
- Waste materials must not be allowed to accumulate in work areas or passageways.
- All hoses, lines and cords from work operations must be protected from damage.

Underground hazards, such as reduced natural ventilation and light difficult and limited access and egress, exposure to air contaminants, fire and explosion, can frequently exist. Therefore, in an effort to minimize injuries and illness associated with underground construction, the following safe work procedure are to be implemented and enforced during all underground construction operations on company projects (referred from Handbook of OSHA Construction Safety and Health, Charles D. Reese and James V. Eidson, Lewis Publishers (1999)).

a. Egress and Access

- The employer's primary responsibility is to provide and maintain a safe means of access and egress to all workstations. This access and egress is to be designed in such a manner that employees are protected from being struck by excavators, haulage machines, trains, and other mobile equipment.
- The employer is to control access to all openings in order to prevent unauthorized entry underground. Unused chutes, manways, or other openings are to be tightly covered, bulkheaded, or fenced off, and are to be posted with warning signs. Completed or unused sections of the underground facility are to be barricaded.

b. Check in/Check out

- The employer must maintain a check in/check out procedure that will ensure that aboveground personnel can determine an accurate count of the number of persons underground in the event of an emergency. However, this procedure is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that permanent environmental controls are effective and no structural failure could occur within the facilities.
- All employees are to be instructed in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects: air monitoring, ventilation, illumination, communications, flood control, mechanical equipment, personal protective equipment, explosives, fire prevention and protection, and emergency procedures, including evacuation plans and check-in/check out system.

c. Communications

- Any coming shifts are to be informed of any hazardous occurrences or conditions that have affected, or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, flooding, fires, or explosions.

- The employer is to establish and maintain direct communications, for the coordination of activities, with other employees whose operations at the jobsite affect, or may affect the safety of employees underground. When natural, unassisted voice communication is ineffective, a power-assisted means of voice communication is to be used to provide communication between the work face, the bottom of the shaft and the surface.
 - Power communication system must operate on an independent power supply, and are to be installed so that the use or disruption of any one phone or signal location will not disrupt the operation of the system from any other location. Communication systems are to be tested upon initial entry of each shift to the underground and as often as necessary at later times, to ensure that they are in working order.
- d. Emergency
- Any employee working alone in a hazardous underground location, who is both out of the range of natural unassisted voice communication and who is not under observation of other persons, is to be provided with an effective means of obtaining assistance in an emergency.
 - At least one designated person needs to be on duty, aboveground, whenever any employee is working underground. This designated person is to be responsible for securing immediate aid, and must keep an accurate count of the employees underground, in case of emergency. The designated person must not be so busy that the counting function is encumbered.
 - Each employee underground shall have an acceptable portable hand lamp or cap lamp, in his or her work area for emergency use, unless natural light or an emergency lighting system provides adequate illumination for escape.
 - On jobsite where 25 or more employees work underground at one time, the employer must provide at least two 5-person rescue teams – one on the jobsite, or within one-half hour travel time from the entry point, and the other one within a 2 hours travel time.
 - On jobsite where less than 25 employees work underground at one time, the employer must provide at least one 5-person rescue team to be either on the jobsite, or within one-half hour travel from the entry point.
 - Rescue team members are to be qualified in rescue procedures, the use and limitation of breathing apparatus and the use of fire-fighting equipment. Qualifications shall be reviewed not less than annually.
- e. Air Quality
- The atmosphere in all underground work areas is to be tested, as often as necessary, to ensure that the atmosphere, at normal atmospheric pressure, contains at least 19.5 percent oxygen and no more than 22 percent oxygen.
 - The atmosphere in all underground work areas is to be tested quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dusts, vapors, mists, and fumes, as often as necessary, to ensure that the permissible exposure limits prescribed are not exceeded.
 - The atmosphere in all underground work areas is to be tested quantitatively for methane and flammable gases as often as necessary.
 - If diesel-engine or gasoline-engine driven ventilating fans or compressors are used, an initial test is to be made of the inlet air of the fan or compressors are used, to ensure that the air supply is not contaminated by engine exhaust.
- f. Hydrogen Sulfide
- Whenever air monitoring indicates the presence of 5 ppm or more of hydrogen sulfide, a test is to be conducted in the affected underground work

area(s), at least at the beginning and midpoint of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

- Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, a continuous sampling and indicating hydrogen sulfide monitor is to be used to monitor the affected work area. Employees are to be informed when a concentration of 10 ppm hydrogen sulfide is exceeded.
- The continuous sampling and indicating hydrogen sulfide monitor is to be designed, installed, and maintained to provide a visual and aural alarm, when the hydrogen sulfide concentration reaches 20 ppm, to signal that additional measures, such as respirator use, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

g. Flammable Gases

- Whenever five percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s), or in the air return, steps are to be taken to increase ventilation air volume, or to otherwise control gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below five percent of the lower explosive limit, but are re-instituted whenever the five percent level is exceeded.
- Whenever 20 percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s), or in the air return, all employees, except those necessary to eliminate the hazard, are to be immediately withdrawn to a safe location aboveground. Electrical power, except for acceptable pumping and ventilation equipment, is to be cut off to the area endangered by the flammable gas, until the concentration of such gas is reduced to less than 20 percent of the lower explosive limit.
- Operations which meet the criteria for potentially gassy and gassy operations are subject to the additional monitoring. A test for oxygen content is to be conducted in the affected underground work areas and the work areas immediately adjacent to such areas, at least at the beginning and midpoint of each shift.
- A record of all air quality tests is to be maintained aboveground at the work-site, and it is to be made available upon request. The record must include the location, date, time, substance, and amount monitored. Records of exposures to toxic substances are to be retained. All other air quality test records shall be retained until completion of the project.

h. Ventilation

- Fresh air is to be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dusts, fumes, mists, vapors, or gases.
- Mechanical ventilation is to be provided in all underground work areas, except when employer can demonstrate that natural ventilation provides the necessary air quality through sufficient air volume and air flow.
- A minimum of 10 m³ of fresh air per minute is to be supplied for each employee underground.
- When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a competent person must test all affected areas after ventilation has been restored and the competent person must determine whether the atmosphere is within flammable limit,

before any power, other than for acceptable equipment, is restored, or before work is resumed. Whenever the ventilation system has been shut down with all employees out of the underground are, only competent persons, who are authorized to test for air contaminants, are allowed to be underground until the ventilation has been restored and all affected areas have been tested for air contaminants and declared safe.

- i. Illumination
 - Illumination requirements, applicable to underground construction operations, must be employed.
- j. Fire Prevention
 - Open flames and fires are to be prohibited in all underground construction operations, except as permitted for welding, cutting, and other hot work operations.
 - Smoking may be allowed only in areas free of fire and explosion hazards. Readily visible signs prohibiting smoking and open flames are to be posted in areas having fire explosion hazards.
 - The employer is not permitted to store underground more than a 24 hour supply of diesel fuel for the underground location, is permitted only if the diesel fuel is contained at the surface.
 - Flammable or combustible materials are not to be stored aboveground within 30 m of any access opening to any underground operation. Where is not feasible because of space limitation at the job-site, such materials may be located within the 100-foot limit, provided that they are located as far as practicable from the opening.
 - A fire extinguisher of at least 4A : 40B : C rating or other equivalent extinguishing means, is to be provided at the head pulley, and at the tail pulley of underground belt conveyers. Any structure located underground, or within 100 feet of an opening to the underground, is to be constructed of material having a fire-resistance rating of at least one hour.
- k. Unstable formations
 - Portal openings and access areas are to be guarded by shoring, fencing, head walls, or other equivalent protection, to ensure safe access of employees and equipment. Adjacent areas are to be scaled, or otherwise secured to prevent loose soil, rock, or fractured materials from endangering the portal and access area.
- l. Drilling
 - A competent person must inspect all drilling and associated equipment prior to each use. Equipment defects, which affect safety, are to be corrected before the equipment is used. The drilling area is to be inspected for hazards before the drilling operation is started
- m. Electricity Safety
 - In addition to the normal electrical construction safety requirements, electric power lines are to be installed, or located away from water lines, telephone lines, air lines, or other conductive materials so the a damaged circuit will not energize the other systems.
 - Lighting circuits are to be located so that movement of personnel or equipment will not damage the circuits or disrupt service.

Besides of all the above mention, it is required proper labor safety equipment for works during construction and operation of the project phase 1 activities.

Main technical and engineering measures can be applied to minimize negative impacts are discussed in details above. For specific activities, mitigation measures are summarized in Table 5.1, Table 5.2, Table 5.3, Table 5.4 and Table 5.5.

5.2 Management mitigation measures

One of the most important environment works, which take a lot of time, complicated, most difficult and danger, is compensation, relocation and clearance work. This subject matter is discussed in **Appendix Relocation and Resettlement**.

Other management mitigation measures applied to minimize impacts from activities of the project phase 1 are presented in Table 5.6, Table 5.7, Table 5.8, Table 5.9 and Table 5.10.

6. Monitoring Program

6.1 Monitoring Program During Construction Stage Of Phases 1

Monitoring shall be conducted under the supervision of the Department of Science, Technology and Environment of Ho Chi Minh City.

6.1.1 Water Quality Monitoring

(1) Periodical Monitoring Program

- a. Monitoring locations, duration, frequency, and number of sample
The whole periodical monitoring program of water quality during construction stage of the project phase 1 is summarized as follows:

Location	Duration (years)	Frequency (time/year)	Sam-ple ng point	Sample per sampling point	Total samples per year	Total sample	Indicator type
Sai Gon River*	2	4	1	4	16	32	A
Tau Hu – Ben Nghe Canal	2	4	6	4	96	192	B
Wastewater treatment plant	4	6	4	4	96	384	B

* Sai Gon River at the junction with Ben Nghe Canal

- b. Monitoring indicators
 - *Type A*: pH, Turbidity, Alkalinity, Acidity, TDS, SS, DO, COD, BOD₅, Cl⁻, N-NH₃, N-NO₂⁻, N-NO₃⁻, N-Org, P-PO₄³⁻, Phenols, Oil, Cr, Pb, Cd, As, Hg, Fecal Coliform, Total Coliform, Pesticide Cl, Pesticide P.



- *Type B:* pH, Turbidity, Alkalinity, Acidity, TDS, SS, DO, COD, BOD₅, Cl⁻, N-NH₃, N-NO₂⁻, N-NO₃⁻, N-Org, P-PO₄³⁻.
- c. Sampling methods
 - At each cross section, samples will be taken at middle location and at 2 depth levels: 1m from the surface and 1 m from the bottom of the canals. For cross sections of the river, sampling will be done at 1 m and 6 m from the surface.
 - Sampling should be taken in the opposite direction of water flow during both low tide and high tide.

(2) Daily Monitoring Program

The whole daily monitoring programs of water quality during construction stage of the project phase 1 is presented as follows:

Location	Duration (years)	Frequency (time/year)	Sam-pling point	Sample per sampling point	Total samples per year	Total sample	Indicator type
Sai Gon River at T-junction with Ben Nghe Canal	2	150	1	8	1,200	2,400	Turbidity

6.1.2 Noise, Vibration And Air Quality Monitoring

(1) Periodical Monitoring Program

- a. Monitoring locations, duration, frequency, and number of sample
The whole periodical monitoring program of noise, vibration, and air quality during construction stage of the project phase 1 is summarized as follows:

Location	Duration (years)	Frequency (time/year)	Sam-pling point	Sample per sampling point	Total samples per year	Total sample	Indicator type
Thanh Da pumping station	2.5	4	2	3	24	60	C

Ben Me Coc 1	2.5	4	2	3	24	60	C
Ben Me Coc 2	1.5	4	2	3	24	36	C
Tau Hu – Ben Nghe Canal	2.0	4	5	3	60	120	D
Sewer and Drainage	3.5	6	6	3	108	378	C
Wastewater treatment plant	4.0	4	2	3	24	96	C
Wastewater pumping station	2.5	4	2	3	24	60	C

b. Monitoring indicators

- *Type C*: Noise, vibration, dust, NO_x, SO_x, and CO.
- *Type D*: Noise, vibration, dust, NO_x, SO_x, CO, NH₃, H₂S, CH₄, and microorganisms.

c. Sampling methods

- As social activities requirement, sampling time can be divided into the following classes:
 - ☐ Rush hours: 6.30 a.m. – 7.30 a.m. and 17.30 a.m. – 18.30 p.m.
 - ☐ Official hours: 8.00 a.m. – 12.00 a.m. and 13.30 p.m. – 17.30 p.m.
 - ☐ Resting time: 22.00 p.m. – 6.00 a.m.
- Therefore, at each measurement point, noise level, and vibration have to be measured for at least 10 minutes, except for air quality which have to be measured for at least 1 hour in each case during rush hours, official hours and resting time.

(2) Daily Monitoring Program

Daily monitoring program of impacts from construction activities to air environmental quality will be carried out mainly by observation and traffic control.

6.2 Monitoring Program During Operation Stage

6.2.1 Water Quality Monitoring

(1) Monitoring locations, duration, frequency, and number of sample

The whole monitoring program of water quality during operation stage is summarized as follows.

Location	Frequency (time/year)	Sampling point	Sample per sampling point	Total samples per year	Indicator type
Sai Gon River*	4	1	4	16	A



Tau Hu – Ben Nghe Canal	4	6	2	48	B
Wastewater treatment plant	6	4	4	96	B

* Sai Gon River at the junction with Ben Nghe Canal.

(2) Monitoring indicators

- *Type A:* pH, Turbidity, Alkalinity, Acidity, TDS, SS, DO, COD, BOD₅, Cl⁻, N-NH₃, N-NO₂⁻, N-NO₃⁻, N-Org, P-PO₄³⁻, Phenols, Oil, Cr, Pb, Cd, As, Hg, Fecal Coliform, Total Coliform, Pesticide Cl, Pesticide P.
- *Type B:* pH, Turbidity, Alkalinity, Acidity, TDS, SS, DO, COD, BOD₅, Cl⁻, N-NH₃, N-NO₂⁻, N-NO₃⁻, N-Org, P-PO₄³⁻.

(3) Sampling methods

- At each cross section, samples will be taken at middle location and at 1 depth level: 1m from the surface. For cross sections of the river and the canal in the area of wastewater treatment plant, sampling will be done at two depth levels: 1 m and 6 m from the surface.
- Sampling should be taken in the opposite direction of water flow during both low tide and high tide.

6.2.2 Noise, Vibration And Air Quality Monitoring

(1) Monitoring locations, duration, frequency, and number of sample

The whole monitoring program of noise, vibration and air quality during operation stage are summarized as follows:

Location	Frequency (time/year)	Sampling point	Sample per sampling point	Total samples per year	Indicator type
Thanh Da pumping station*	4	2	3	24	C
Ben Me Coc 1*	4	2	3	24	C
Wastewater pumping station**	4	2	3	24	D
Wastewater treatment plant***	4	2	3	24	D

* from the year 2004

** from the year 2005

*** from the year 2006

(2) Monitoring indicators

- *Type C:* Noise, vibration, dust, NO_x, SO_x, and CO.
- *Type D:* Noise, vibration, dust, NO_x, SO_x, CO, NH₃, H₂S, CH₄, and microorganisms.

(3) Sampling methods

- As social activities requirement, sampling time can be divided into the following classes:
 - ☐ Rush hours: 6.30 a.m. – 7.30 a.m. and 17.30 a.m. – 18.30 p.m.
 - ☐ Official hours: a.m. – 12.00 a.m. and 13.30 p.m. – 17.30 p.m.
 - ☐ Resting time: 22.00 p.m. – 6.00 a.m.
- Therefore, at each measurement point, noise level, and vibration have to be measured for at least 10 minutes, except for air quality which have to be measured for at least 1 hour in each case during rush hours, official hours and resting time.

6.3 COST ESTIMATE FOR MONITORING PROGRAM

Total cost for monitoring program during construction stage is estimated as follows:

Monitoring type	Survey Type	Cost (million VND)	Cost (USD)
Periodical	<i>Water Quality</i>		
	Analysis	297	20,489
	Labor	13	914
	Transportation	27	1,830
	<i>Noise, Vibration, and Air Quality</i>		
	Analysis	270	18,604
	Labor	84	5,280
	Transportation	105	7,216
Daily	<i>Water Quality</i>		
	Analysis	30	2,052
	Labor	62	4,283
	Total	888	61,170

Total cost for monitoring program during operation stage is estimated as follows:

No.	Survey Type	Cost (million VND/year)	Cost (USD/year)
01	<i>Water Quality</i>		



	Analysis	91	6,312
	Labor	4	286
	Transportation	8	572
02	<i>Noise, Vibration, and Air Quality</i>		
	Analysis	44	3,309
	Labor	10	685
	Transportation	12	857
	<u>Total</u>	170	11,750

TABLE 1.1 INITIAL ENVIRONMENTAL EXAMINATION FOR TAU HU – BEN NGHE PROJECT

No.	Environmental Item	Initial Environmental Examination
Social Environment		
1.	Resettlement	Improvement of Tau Hu-Ben Nghe-Doi-Te canal will involve resettlement as many illegal squatter exist along the canal. Detailed analysis required.
2.	Economic activities	Resettled people may lose their job. This issue should be studied along with resettlement issue.
3.	Traffic and public facilities	Not much impact expected. Temporary impact during construction stage may be there.
4.	Split of regional communities	No such impact expected
5.	Cultural Property	Existence of any cultural monuments/property should be examined along the interceptor route and treatment plant site.
6.	Water Rights and Rights of common	Obstructing of fishing rights at Nha Be river d/s of treatment plant should be studied.
7.	Public health condition	Public health will be improved as wastewater will be treated before discharging to public water bodies.
8.	Waste	Proper sites for construction waste, sludge generated need to be identified
9.	Hazard	Sludge characteristics of Tau Hu Canal to be rehabilitated should be analyzed before formulating disposal measures.
Natural Environment		
10.	Topography and Geology	Change of topography and geology due to excavation and earthfill at treatment plant site should be investigated.
11.	Groundwater	Treatment of wastewater will prevent further pollution of groundwater in the study area.
12.	Fauna and Flora	Although not much negative impact expected, further analysis of impact of project activities on Flora and Fauna should be done.
13.	Landuse	Landuse plan of treatment plant site will be changed, impact should be studied.
Pollution		
14.	Air Pollution	Not much impact is expected from the gases produced at treatment plant site. Detailed analysis will be done in EIA study.
15.	Water pollution	Wastewater will be collected and treated and pollution in water bodies will reduce. Water quality of rivers in the priority project area and at effluent disposal point should be investigated.
16.	Soil Contamination	Soil contamination due to disposal of sludge from canals should be analyzed by analyzing sludge characteristics.
17.	Noise and Vibration	Impact during construction phase and also in operation phase due to operation of pumps should be studied.
18.	Land Subsidence	No such danger of land subsidence expected and should be studied during detailed EIA study
19.	Offensive Odor	Due to operation of wastewater treatment plant offensive odor will be produced. Impact should be minimized by construction of buffer zone.

TABLE 4.1 SIGNIFICANT IMPACT MATRIX

Project activity	Natural Environment						Social Environment				
	Aesthetic View	Surface water	Ground water	Air Environment	Soil Environment	Biological Resources & Ecosystem	Prevention of flood	Living Environment (Public health)	Infrastructure	Relocation	Employment opportunity
1 Pre Construction Stage											
Land procurement	-	-	-	-	-	CB	-	-	-	AA	-
2 Construction Stage											
2.1 Construction of Sewers and Rehabilitation of Existing Sewers											
Transportation of construction material	CB	CB	-	CB	-	-	-	CB	-	-	P
Excavation work	BB	CB	-	CB	-	-	CB	-	CB	-	P
Transportation and disposal of spoil	BB	BB	-	CB	BA	-	-	-	-	-	P
Transportation and disposal of sediment	BB	BB	-	CB	BA	-	-	-	-	-	P
2.2 Improvement of Tau Hu-Ben Nghe, Doi-Te Canals											
Dredging of sediment from THBN canal	CB	AB	-	CB	-	CB	P	CB	CB	-	P
Construction of THBNDT canals	CB	BB	-	CB	-	CB	P	-	P	-	P
Transportation and disposal of sediments	CB	BB	-	CB	BA	CB	-	CB	-	-	P
3 Operation Stage											
3.1 Operation of Sewerage System and Tau Hu - Ben Nghe Canal											
Disposal of sewer sediment	CB	CB	-	CB	CA	-	-	CB	-	-	P
Disposal of sediment dredging	CB	CB	-	CB	CA	-	-	CB	-	-	P
Wastewater discharge	-	CA	P	CA	P	P	P	P	-	-	-
3.2 Operation of Wastewater Treatment Plant											
Treated wastewater discharge	-	P	P	P	P	P	-	P	-	-	P
Disposal of solid waste from pumping stations	CB	CB	-	CB	BA	-	-	CB	-	-	P
Disposal of sludge from wastewater treatment plant	CB	CB	-	CB	BA	-	-	CB	-	-	P

Note P=> Positive Impact

AA => Serious Negative Long-term Impact

AB=> Serious Negative Short-term Impact

BA=> Moderate Negative Long-term Impact

BB=> Moderate Negative Short-term Impact

CA => Minor Negative Long-term Impact

CB=> Minor Negative Short-term Impact

TABLE 5.1 (1/2) TECHNICAL MITIGATION MEASURES OF TAU HU – BEN NGHE CANAL IMPROVEMENT ACTIVITIES

22	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Dredging of sediment from Tau Hu – Ben Nghe Canal	Construction	Air pollution	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from dredging equipment.	Ensuring adequate maintenance of construction vehicles and equipment.
			Noise	Noise emit from dredging equipment.	Ensuring adequate maintenance of construction equipment.
			Odors	Odor release from sediment.	Covering immediately after filling into barge.
			Surface water pollution	Water quality (BOD) degradation due to suspension of sediment.	Selecting suitable dredging method.
				Dissolving heavy metals from dredged sludge into water	Selecting suitable dredging method.
02	Storage and transportation of the sediment	Construction	Surface water pollution	Oil and grease release to canal from dredging equipment.	Minimize oil spills.
				Odor release from collected sediment	Transporting sediment with proper covering.
			Surface water pollution	Overflow and run off carrying organic pollutants and contaminate surface water body	Transporting sediment by sufficient capacity barges
				Overflow and run off carrying heavy metals and contaminate surface water body	Transporting sediment by sufficient capacity barges
				Visual impact during transportation of sediment offsite.	Proper covering during transportation.
03	Disposal of sediment	Construction	Aesthetics	Visual impact of uncontrolled disposal of sediment at dumping site.	1. Dispose of sediments at a secure landfill. 2. Conducting EIA for proposed new disposed site and design (responsible for Waterway Management)
				Odor emission from dumping site	1. Dispose of sediments at a secure landfill 2. Conducting EIA for the proposed site and design for a new disposal site (responsible for Waterway Management).
			Odors	Organic contamination of underground water from disposed sediment at dumping site.	Disposal to secure landfill.
				Heavy metals contamination of underground water from disposed sediment at dumping site	Evaluating heavy metals concentrations in dredged sludge and appropriate use for construction fill (responsible for Waterway Management).

TABLE 5.1 (2/2) TECHNICAL MITIGATION MEASURES OF TAU HU – BEN NGHE CANAL IMPROVEMENT ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
03	Disposal of sediment	Construction	Surface water quality	Run off carry organic pollutants offsite and degrade adjacent receiving water bodies.	Disposal to secure landfill.
			Public health and safety	Run off carry heavy metals offsite and degrade adjacent receiving water bodies.	Disposal to secure landfill.
				Inappropriate disposal can cause public health problem risk.	Disposal to secure landfill.

TABLE 5.2 (1/2) TECHNICAL MITIGATION MEASURES OF DRAINAGE PUMPING STATION IMPROVEMENT ACTIVITIES AT THANH DA, BEN ME COC 1 & BEN ME COC 2

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of embankment, flap gate, pump station, storm sewer, and other related structures	Construction	Aesthetics	Spilling of spoil, and fill construction material causing visual impacts.	Proper temporary storage of spoils, fill materials, and construction materials.
				Indiscriminate parking of construction vehicles and equipment cause severe visual impact.	Providing alternative parking locations
			Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment	Ensuring adequate maintenance of construction vehicles and equipment.
			Fugitive dust particles emissions (FDPs)	Excavation of trench emits substantial amount of FDPs.	1. Wetting earth within trench before excavating 2. Wetting the trench regularly during filling, compacting, and consolidating. 3. Wetting the trench regularly during filling, compacting, and consolidating.
				Onsite storage of spoil and fill materials also emits large amount of FDPs.	1. Minimizing onsite storage of spoil and fill materials 2. Covering spoil and fill materials.
				Breaking of pavement also causes FDPs.	Wetting surface before breaking.

TABLE 5.2 (2/2) TECHNICAL MITIGATION MEASURES OF DRAINAGE PUMPING STATION IMPROVEMENT ACTIVITIES AT THANH DA, BEN ME COC 1 & BEN ME COC 2

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures	
01	Construction of embankment, dike, flap gate, pump station, storm sewer, and other related structures	Construction	Noise	Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	1. Adequate maintenance of the construction vehicles and equipment. 2. Using quietest construction vehicles and equipment. 3. Specifying and controlling maximum noise level at sensitive receptors.	
				Surface water pollution	Surface water contamination by oil spills from construction vehicles and equipment	Adequate maintenance of construction vehicles and equipment.
					Flooding	Rehabilitation of existing sewers can cause local flooding if temporary drainage diversion is not in place.
		Operation		Rehabilitation of drainage pipes will improve flows and therefore minimize potential flooding problems.		Ensuring regular maintenance of the sewers.
				Construction	Occupational health effects	Noise impacts from breaking of pavement/floor activities.
		Public health and safety				Trench left open over-night without proper warning signs can cause public health risk and safety.
				Air, dust, and FDPs emission cause severe public health risk	3. Adequate warning signs and signal light.	
						1. Washing all construction vehicles before leaving the construction site to remove earth materials adhered to the tires, etc. 2. Remove all mud deposit on streets by construction vehicles because it causes air emission problems, discomfort to road users and ultimately traffic accidents.
		Aesthetics		Visual impacts during transportation of deposit offsite.		Transporting spoil with cover.
				Visual impacts of uncontrolled disposal of deposit at dumping site.	Disposing at a secure landfill.	
			Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from transportation vehicles.	Adequate maintenance of the transportation vehicles and equipment.	

TABLE 5.3 (1/3) TECHNICAL MITIGATION MEASURES OF EXISTING COMBINED SEWER IMPROVEMENT ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new linings in existing sewer system	Construction	Aesthetics	Piling of spoil, and fill and construction material cause visual impacts.	Proper temporary storage of spoils, fill materials, and construction materials.
				Indiscriminate parking of construction vehicles and equipment cause severe visual impact.	Providing alternative parking locations
			Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment	Adequate maintenance of the construction vehicles and equipment
			Fugitive dust particles emissions (FDPs)	Excavation of trench emit substantial amount of FDPs.	1. Wetting earth within trench before excavating 2. Wetting the trench regularly during filling, compacting, and consolidating.
				Onsite storage of spoil and fill materials also emit large amount of FDPs.	1. Minimizing onsite storage of spoil and fill materials. 2. Covering spoil and fill materials by plastic covers.
				Breaking of pavement also causes FDPs.	Wetting surface before breaking.
			Noise	Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	1. Adequate maintenance of the construction vehicles and equipment. 2. Using quietest construction vehicles and equipment. 3. Specifying and controlling maximum noise level at sensitive receptors.
				Surface water contamination by oil spills from construction vehicles and equipment	Adequate maintenance of construction vehicles and equipment.
			Flooding	Rehabilitation of existing sewers can cause local flooding if temporary drainage diversion is not in place.	Providing adequate drainage diversion plan.

TABLE 5.3 (2/3) TECHNICAL MITIGATION MEASURES OF EXISTING COMBINED SEWER IMPROVEMENT ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new linings in existing sewer system	Operation	Flooding	Rehabilitation of blocked sewers will improve flows and therefore minimize potential flooding problems.	Ensuring regular maintenance of the sewers.
		Construction	Occupational health effects	High exposure to occupational help hazard if worker do not follow strict safety procedure and precaution before entering sewer/manholes	1. Providing breathing apparatus and ventilation equipment. 2. Equipping workers with methane detection devices.
			Occupational health effects	Noise impacts from breaking of pavement/floor activities.	Providing workers protective hearing devices.
			Public health and safety		Trench left open over-night without proper warning signs can cause public health risk and safety.
02	Construction	Public health and safety		Air, dust, and FDPs emission cause severe public health risk	1. Washing all construction vehicles before leaving the construction site to remove earth materials adhered to the tires, etc. 2. Remove all mud deposit on streets by construction vehicles because it causes air emission problems, discomfort to road users and ultimately traffic accidents.
				Visual impacts during transportation of deposit offsite.	Transporting spoil with cover.
			Visual impacts of uncontrolled disposal of deposit at dumping site.	Disposing at a secure landfill.	
			Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from transportation vehicles and equipment.	Adequate maintenance of the transportation vehicles and equipment.	

TABLE 5.3 (3/3) TECHNICAL MITIGATION MEASURES OF EXISTING COMBINED SEWER IMPROVEMENT ACTIVITIES (CONTINUED)

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
02	Transportation, disposal of spoil and fill material and pipes	Construction	Fugitive dust particles emissions (FDPs)	Emitting FDPs during transportation of spoil and fill materials from the site.	1. Washing all transport vehicles before leaving the construction site to remove earth/soil/spoil materials adhered to the tires, etc. Providing suitable wash trough with silt trap.
					2. Removing mud deposited on streets by construction vehicles because it causes air emission problems.
					3. Cover up materials to be transported.
			Odors	Odors emit from transportation vehicles.	Transporting spoil with cover.
				Odors emit from dumping site.	Dispose of spoil at a secure landfill
			Underground water pollution	Underground water contamination by organic matters and heavy metal if dumping site is not well designed and monitored.	Depositing to secure landfill.
			Surface water pollution	Spills of engine oil cause degradation of surface water quality.	Adequate maintenance of transportation vehicles and equipment.
				Unwell control of spoil disposal can cause surface water quality degradation.	Disposing at secure landfill.
			Occupational health	Getting effects from deposits during transportation.	Transporting spoil with cover.
			Public health and safety	Getting effects from deposits during dumping activities.	Providing labor safety equipment such as gauze mask, gloves, and boots.
				Inappropriate disposal can cause public health problem risk.	Dispose of spoil at a secure landfill

TABLE 5.4 (1/4) TECHNICAL MITIGATION MEASURES OF INTERCEPTOR SEWER AND CONVEYANCE CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new interceptor /conveyance	Construction	Aesthetics	Piling of spoil, fill materials, and construction materials cause visual impacts.	Requesting for temporary storage of spoils, fill materials and construction materials.
				Indiscriminating parking of construction vehicles cause severe visual impacts	Providing alternative parking locations.
			Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y , emission from construction vehicles and equipment	Adequate maintenance of the construction vehicles and equipment
			Fugitive dust particles emissions (FDPs)	Excavating of trench emit substantial amount of FDPs.	1. Wetting earth within trench before excavating 2. Wetting the trench regularly during filling, compacting, and consolidating.
				Onsite storage of spoil and fill materials emit large amount of FDPs.	1. Minimizing onsite storage of spoil and fill materials 2. Covering spoil and fill materials by plastic covers.
				Breaking of pavement also cause FDPs emissions	Wetting surface before breaking.
			Noise	1. Breaking of pavement emits high level of noise from the compressor and the impact of cutting tool on pavement. 2. Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	1. Using quietest construction vehicles and equipment. 2. Adequate maintenance of construction vehicles and equipment. 3. Specifying and controlling maximum noise level at sensitive receptors.

TABLE 5.4 (2/4) TECHNICAL MITIGATION MEASURES OF INTERCEPTOR SEWER AND CONVEYANCE CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new interceptor /conveyance	Construction	Surface water pollution	Silting of adjacent water body due to soil from spoil and fill materials which is carried down by runoff.	1. Providing silt trap where space and construction technique allow.
					2. Directly depositing spoil onto transportation vehicles to minimize onsite storage.
					3. It is prefer to carry out activity during dry period.
				Water contamination by oil spills from construction vehicles and equipment.	Adequate maintenance of construction vehicles and equipment.
					1. Providing silt trap where space and construction technique allow.
				Silting (silt carried down by runoff) of adjacent drains and rivers cause flooding problems.	2. Directly depositing spoil onto transportation vehicles to minimize onsite storage.
					3. It is prefer to carry out activity during dry period.
		Operation and Maintenance	Flooding	Construction of existing sewers can cause local flooding if temporary drainage diversion is not in place.	Providing suitable drainage diversion plan.
				The rehabilitation of blocked sewers will improve flows and therefore minimize potential flooding problems.	
				High exposure to occupational health hazard if workers do not follow strict safety procedure and precaution before entering of sewers.	Ensuring regular maintenance of the sewers.
		Construction	Occupational health	Noise impact from breaking of pavement/floor activities.	1. Providing breathing apparatus and ventilation equipment.
					2. Equip workers with methane detection devices.
			Public health and safety		Providing protective hearing devices for workers.
				Trench left open over-night without proper warning signs can cause public health risk and safety.	1. Temporary close the opened trench after the completion of daily work activity.
					2. Providing proper barrier to open trench to prevent to public from falling into the open trench.
					3. Adequate warning signs and signal light.

TABLE 5.4 (3/4) TECHNICAL MITIGATION MEASURES OF INTERCEPTOR SEWER AND CONVEYANCE CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new interceptor /conveyance	Construction	Public health and safety	Air, dust, and FDPs emission cause severe public health risk	<ol style="list-style-type: none"> 1. Washing all construction vehicles before leaving the construction site to remove earth materials adhered to the tires, etc. 2. Remove all mud deposit on streets by construction vehicles because it causes air emission problems, discomfort to road users and ultimately traffic accidents.
02	Transportation and disposal of spoil and fill materials and pipes	Construction	Aesthetics	Visual impacts during transportation of deposit offsite.	Transporting spoil with cover.
				Visual impacts of uncontrolled disposal of deposit at dumping site.	Disposing at a secure landfill.
			Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from transportation vehicles and equipment.	Adequate maintenance of the transportation vehicles and equipment.
			Fugitive dust particles emissions (FDPs)	Emitting FDPs during transportation of spoil and fill materials from the site.	<ol style="list-style-type: none"> 1. Washing all transport vehicles before leaving the construction site to remove earth/soil/spoil materials adhered to the tires, axles, etc. Providing suitable wash trough with silt trap. 2. Removing mud deposited on streets by construction vehicles because it causes air emission problems. 3. Cover up materials to be transported.
			Odors	Odors emit from transportation vehicles. Odors emit from dumping site.	Transporting spoil with cover. Dispose of spoil at a secure landfill
			Underground water pollution	Underground water contamination by organic matters and heavy metal if dumping site is not well designed and monitored.	Deposing to secure landfill.

TABLE 5.4 (4/4) TECHNICAL MITIGATION MEASURES OF INTERCEPTOR SEWER AND CONVEYANCE CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
02	Transportation and disposal of spoil and fill materials and pipes	Construction	Surface water pollution	Spills of engine oil cause degradation of surface water quality.	Adequate maintenance of transportation vehicles and equipment.
				Unwell control of spoil disposal can cause surface water quality degradation.	Disposing at secure landfill.
			Occupational health	Getting effects from deposits during transportation.	Transporting spoil with cover.
			Public health and safety	Getting effects from deposits during dumping activities. Inappropriate disposal can cause public health problem risk.	Providing labor safety equipment such as gauze mask, gloves, and boots. Dispose of spoil at a secure landfill
03	Operation of sewers	Operation and Maintenance	Odors	Free flow environment achieved after the rehabilitation will minimize the emission of odor from the sewers due to no stagnation of flow.	Ensuring regular maintenance of the sewers.
			Flooding	New sewers will improve flows and therefore minimize potential flooding problems.	Ensuring regular maintenance of the sewers.
			Occupational health	High exposure to occupational health hazard if workers do not follow strict safety procedure and precaution before entering of sewers.	1. Providing breathing apparatus and ventilation equipment. 2. Equip workers with methane detection devices.
			Public health and safety	New sewers will improve the flows and prevent potential breeding of mosquitoes therefore minimize spreading of dangerous diseases transmitted by mosquitoes, improve hygiene and reduce waterborne diseases.	Ensuring regular maintenance of the sewers.

**TABLE 5.5 (1/2) TECHNICAL MITIGATION MEASURES OF LIFT PUMPING STATION AND WASTEWATER TREATMENT PLANT
CONSTRUCTION ACTIVITIES**

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of lift pumping station and wastewater treatment plant	Construction	Air emissions	Onsite burning of waste materials cause air pollution.	Prohibit onsite burning, and incorporate such requirement in contract document.
				Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment	Adequate maintenance of the construction vehicles and equipment
				FDPs emit during clearing/grading/preparation of site	1. Wetting opened surface continuously. 2. Providing turf on open surfaces where possible. 3. Always minimize surface to be opened.
			Fugitive dust particles emissions (FDPs)	FDPs emit from earthwork activities, excavation and filling.	1. Wetting opened surface continuously. 2. Providing turf on open surfaces where possible. 3. Cover with plastic material where practical.
				FDPs emit from transportation vehicles such as bumper, horizontal axles, and uncovered transportation materials.	Remove soil material deposited on axles, bumper, etc. before driving on public streets.
				FDPs emit from soil/mud on the streets	1. Washing all construction and transportation vehicles before leaving the construction site to remove earth materials adhered to the tires, axles, etc., providing suitable wash trough with silt trap. 2. Remove mud deposited on streets by construction vehicles because it causes air emissions problem. 3. Providing appropriate cover for transported materials.
			Noise	1. Breaking of pavement emits high level of noise from the compressor and the impact of cutting tool on pavement.	1. Using quietest construction vehicles and equipment.
				2. Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise.	2. Adequate maintenance of construction vehicles and equipment. 3. Specifying and controlling maximum noise level at sensitive receptors.

TABLE 5.5 (2/2) TECHNICAL MITIGATION MEASURES OF LIFT PUMPING STATION AND WASTEWATER TREATMENT PLANT CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of lift pumping station and wastewater treatment plant	Construction	Surface water quality	Silting of soil materials (from spoil and fill materials stored on site) at adjacent water bodies due to runoff.	1. Providing silt trap where space and construction technique allow.
				Water contamination by oil spills from construction vehicles and equipment.	2. Minimizing onsite storage of spoil and fill materials, directly deposit spoils onto transportation vehicles.
				Piling process emits excessive noise and can cause serve occupational health impact to the workers.	3. Carrying out activity during dry period. Adequate maintenance of the construction vehicles and equipment.
			Occupational health	Temporary disruption of water supply due to installation of water supply system to the plant.	Providing protective hearing devices for workers.
			Utilities	Temporary power outage during electrical installation of power supply to the plant.	1. Ensuring disruption is within very short period. 2. Providing advance announcement
				Temporary diversion of drainage flow might cause local flooding problem.	1. Ensuring disruption is within very short period. 2. Providing advance announcement
02	Transportation and disposal of spoil and fill materials and pipes	Construction	Surface water pollution	Temporary disruption of telephone services during construction.	1. Ensuring disruption is within very short period. 2. Providing advance announcement
				Spills of engine oil cause degradation of surface water quality.	1. Ensuring disruption is within very short period. 2. Providing advance announcement
				Unwell control of spoil disposal can cause surface water quality degradation.	Adequate maintenance of transportation vehicles and equipment.
					Disposing at secure landfill.

TABLE 5.6 MANAGEMENT MITIGATION MEASURES OF TAU HU – BEN NGHE CANAL IMPROVEMENT ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Dredging of sediment from Tau Hu – Ben Nghe Canal	Construction	Air pollution	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from dredging equipment.	Adequate schedule during construction period
			Noise	Noise emit from dredging equipment.	1. Adequate schedule during day and night 2. Adequate arrangement of concurrent operation equipment
02	Storage and transportation of the sediment	Construction	Traffic congestion	Increase traffic congestion	Preparing traffic management plan.
03	Disposal of sediment	Construction	Underground water pollution	Organic contamination of underground water from disposed sediment at dumping site. Heavy metals contamination of underground water from disposed sediment at dumping site	Conducting monitoring program (responsible for Waterway Management Office) Conducting monitoring program (responsible for Waterway Management Office)
			Surface water quality	Run off carry organic pollutants offsite and degrade adjacent receiving water bodies.	Conducting monitoring program (responsible for Waterway Management Office)
				Run off carry heavy metals offsite and degrade adjacent receiving water bodies.	Conducting monitoring program (responsible for Waterway Management Office)
					Conducting monitoring program (responsible for Waterway Management Office)

TABLE 5.7 (1/2) MANAGEMENT MITIGATION MEASURES OF DRAINAGE PUMPING STATION IMPROVEMENT ACTIVITIES AT THANH DA, BEN ME COC 1 & BEN ME COC 2

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of embankment, flap gate, pump station, storm sewer, and other related structures	Construction	Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	Preparing traffic management plan for implementation during rehabilitation stage. Preparing traffic management plan for implementation during rehabilitation stage.
			Noise	Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	1. Planning construction activities to minimize duration of high noise exposure. 2. Informing residents expected duration of particular noisy activity to minimize complaints. 3. Using construction curfews on certain hours or days to suit local social and economic needs and to comply with local laws and requirements.

TABLE 5.7 (2/2) MANAGEMENT MITIGATION MEASURES OF DRAINAGE PUMPING STATION IMPROVEMENT ACTIVITIES AT THANH DA, BEN ME COC 1 & BEN ME COC 2

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of embankment, flap gate, pump station, storm sewer, and other related structures	Construction	Traffic congestion	Concentrating of construction vehicles and equipment caused increase of traffic congestion.	1. Preparing traffic management plan to minimize number of vehicles on streets and discourage long-term parking of vehicles and equipment at site.
					2. Notifying public in advance of the construction plan to avoid using specific routes.
			Business disruption	Temporary street closure and onsite storage of spoil and construction materials causes disruption to business.	3. Adopting appropriate construction sequencing and schedule.
					1. Preparing traffic management plan.
			Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from transport vehicles and equipment.	2. Adopting appropriate construction sequencing and schedule.
					3. Performing construction activities during low business hours.
			Traffic congestion	Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	4. Requesting for temporary storage of spoils and fill and construction materials.
					Preparing traffic management for implementation during rehabilitation stage.
				Increase traffic congestion.	Preparing traffic management plan for implementation during rehabilitation stage.

TABLE 5.8 (1/2) MANAGEMENT MITIGATION MEASURES OF THE EXISTING COMBINED SEWER IMPROVEMENT ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new linings in existing sewer system	Construction	Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment	Preparing traffic management plan for implementation during rehabilitation stage.
				Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	Preparing traffic management plan for implementation during rehabilitation stage.
			Noise	Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	<ol style="list-style-type: none"> 1. Planning construction activities to minimize duration of high noise exposure. 2. Informing residents expected duration of particular noisy activity to minimize complaints. 3. Using construction curfews on certain hours or days to suit local social and economic needs and to comply with local laws and requirements.
				Concentrating of construction vehicles and equipment caused increase of traffic congestion.	<ol style="list-style-type: none"> 1. Preparing traffic management plan to minimize number of vehicles on streets and discourage long-term parking of vehicles and equipment at site. 2. Notifying public in advance of the construction plan to avoid using specific routes. 3. Adopting appropriate construction sequencing and schedule.
			Business disruption	Temporary street closure and onsite storage of spoil and construction materials cause disruption to business.	<ol style="list-style-type: none"> 1. Preparing traffic management plan. 2. Adopting appropriate construction sequencing and schedule. 3. Performing construction activities during low business hours. 4. Requesting for temporary storage of spoils and fill and construction materials.

TABLE 5.8 (2/2) MANAGEMENT MITIGATION MEASURES OF THE EXISTING COMBINED SEWER IMPROVEMENT ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
02	Transportation, disposal of spoil and fill material and pipes	Construction	Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from transport vehicles and equipment. Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	Preparing traffic management for implementation during rehabilitation stage. Preparing traffic management plan for implementation during rehabilitation stage.
			Traffic congestion	Increase traffic congestion.	Preparing traffic management plan for implementation during rehabilitation stage.
			Underground water pollution Surface water pollution	Spilling of sewage onsite during collection and transportation. Spilling of sewage onsite during collection and transportation cause surface water quality degradation.	Educating workers to minimize spills. Educating workers to minimize spills.
03	Transportation and disposal of sewers sediments	Construction Operation & Maintenance			

TABLE 5.9 (1/2) MANAGEMENT MITIGATION MEASURES OF INTERCEPTOR SEWER AND CONVEYANCE CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new interceptor /conveyance	Construction	Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	Preparing traffic management plan for implementation during construction stage. Preparing traffic management plan for implementation during construction stage.
			Noise	1. Breaking of pavement emits high level of noise from the compressor and the impact of cutting tool on pavement. 2. Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	1. Planning construction activities to minimize duration of high noise exposure. 2. Informing residents expected duration of particular noisy activity to minimize complaints. 3. Using construction curfews on certain hours or days to suit local social and economic needs and to comply with local laws and requirements.

TABLE 5.9 (2/2) MANAGEMENT MITIGATION MEASURES OF INTERCEPT SEWER AND CONVEYANCE CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of new interceptor /conveyance	Construction	Traffic congestion	Laying of pipes/culverts/manholes cause severe traffic slow down and congestion	<ol style="list-style-type: none"> 1. Preparing traffic management plan to minimize number of vehicles on streets and discourage long-term parking of vehicles and equipment at site. 2. Notifying public in advance of the construction plan to avoid using specific routes. 3. Adopting appropriate construction sequencing and schedule.
				Construction vehicles and equipment involved in the construction cause traffic congestion.	<ol style="list-style-type: none"> 1. Preparing traffic management plan to minimize number of vehicles on streets and discourage long-term parking of vehicles and equipment at site. 2. Notifying public in advance of the construction plan to avoid using specific routes. 3. Adopting appropriate construction sequencing and schedule.
			Business disruption	Temporary street closure and onsite storage of spoil and construction materials cause disruption to business.	<ol style="list-style-type: none"> 1. Preparing traffic management plan. 2. Adopting appropriate construction sequencing and schedule. 3. Performing construction activities during low business hours. 4. Requesting for temporary storage of spoils and fill and construction materials.
				High exposure to occupational health hazard if workers do not follow strict safety procedure and precaution before entering of sewers.	<ol style="list-style-type: none"> 1. Preparing occupational health guideline for workers who access the sewers. 2. Training worker exposed to risks.
02	Transportation and disposal of spoil and fill materials and pipes	Construction	Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from transport vehicles and equipment.	Preparing traffic management for implementation during rehabilitation stage.
				Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	Preparing traffic management plan for implementation during rehabilitation stage.
			Traffic congestion	Increase traffic congestion.	Preparing traffic management plan for implementation during rehabilitation stage.

TABLE 5.10 MANAGEMENT MITIGATION MEASURES OF LIFT PUMPING STATION AND WASTEWATER TREATMENT PLANT CONSTRUCTION ACTIVITIES

No.	Project Activities	Project Stage	Issues	Description of Impacts	Mitigation Measures
01	Construction of lift pumping station and wastewater treatment plant	Construction	Air emissions	Polluted air including NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from construction vehicles and equipment	Preparing traffic management plan for implementation during construction stage.
				Increasing NO _x , SO ₂ , CO, CO ₂ , C _x H _y emission from slow traffic caused by construction activities.	Preparing traffic management plan for implementation during construction stage.
			Noise	1. Breaking of pavement emits high level of noise from the compressor and the impact of cutting tool on pavement.	1. Planning construction activities to minimize duration of high noise exposure.
				2. Activities of construction vehicles such as backhoe and earth moving vehicles also emit noise	2. Informing residents expected duration of particular noisy activity to minimize complaints.
					3. Using construction curfews on certain hours or days to suit local social and economic needs and to comply with local laws and requirements.
			Traffic congestion	Increase traffic congestion.	Preparing traffic management plan for implementation during rehabilitation stage.
			Business disruption	Temporary street closure and onsite storage of spoil and construction materials causes disruption to business.	1. Preparing traffic management plan. 2. Adopting appropriate construction sequencing and schedule. 3. Performing construction activities during low business hours. 4. Requesting for temporary storage of spoils and fill and construction materials.

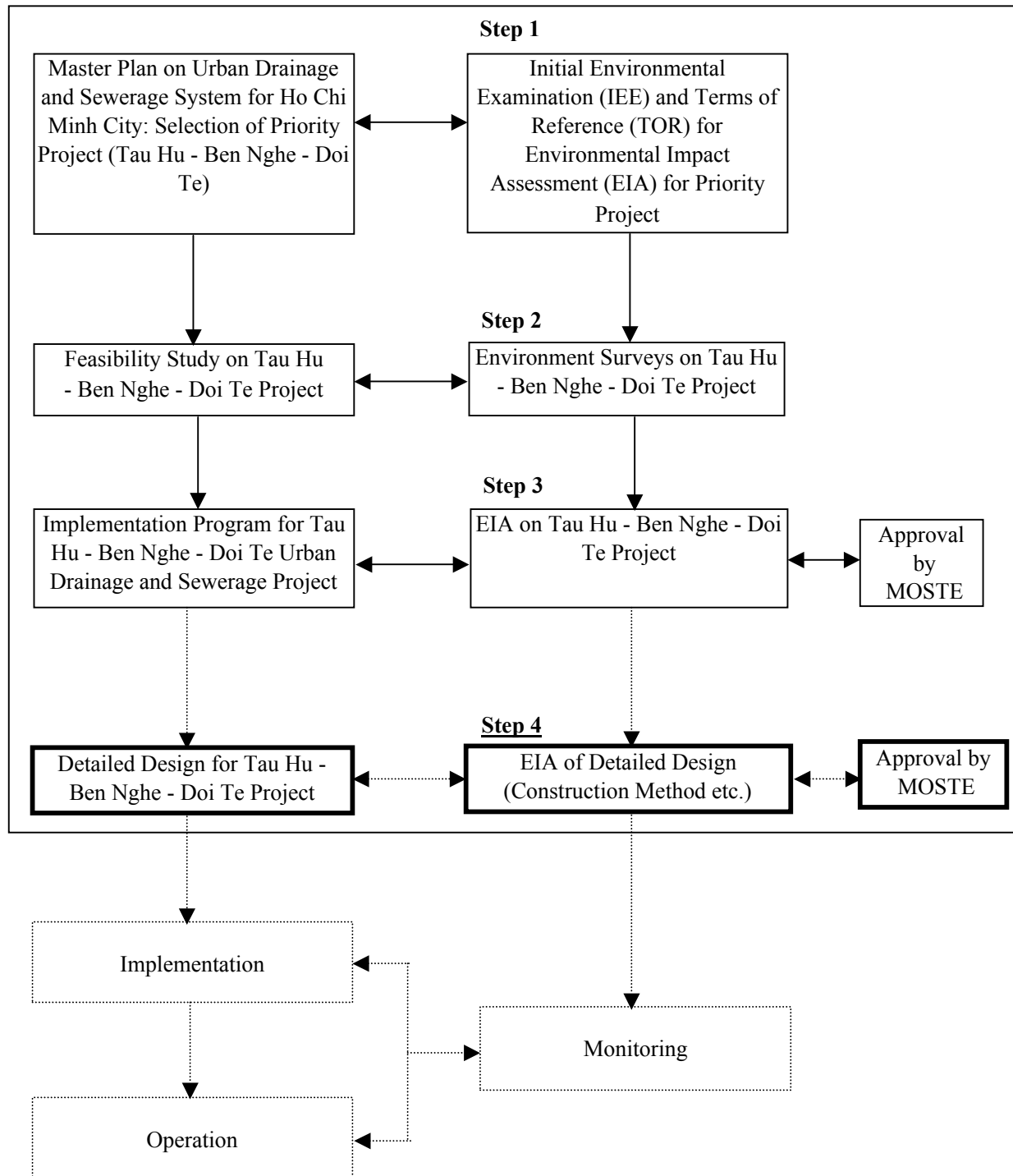


FIG 1.1 STEPS IN ENVIRONMENTAL IMPACT ASSESSMENT

RELOCATION AND RESETTLEMENT



Appendix Relocation and Resettlement

1. Boundary of the Project

A detail household survey for relocation/resettlement will be done on the basis of the boundary of the Project in order to determine the exact affected area and affected household (house) number.

1.1 Boundary of Each Project Sites

(1) Canal Improvement

The boundary of the project around Tau Hu – Ben Nghe Canal is described below:

- The area for this project includes:
 - the southern bank of Tau Hu - Ben Nghe Canal (Phase I);
 - the western part of the northern bank of Tau Hu Canal (Phase I);
 - all the banks of Ben Me Coc (1) and (2) (Phase I);
 - the eastern bank of Channel 2 (Phase II); and
 - the both sides of Channel 1 (Phase II).

The relocation/resettlement for the northern bank of canal (district 1, district 5, and district 6) will be done in East – West Highway Project.
- Following the relocation policy of HCMC, the houses located from the bank of the canal to the road will be cleared.
- One part of the waterway in Tau Hu – Ben Nghe Canal, which will be influenced by East – West Highway Project. This affected area is 6,215 m².

(2) Thanh Da Drainage Pumping Station

The necessary area for the dike is 375 m², and that for the pumping station is 765 m².

Relocation/resettlement will be carried out in Phase I.

(3) Ben Me Coc (1) Drainage Pumping Station

The necessary area of the pumping station, gate and retarding pond (existing at present) is 692 m², 800 m², 19,000 m², respectively.

Relocation/resettlement will be carried out in Phase I.

(4) Ben Me Coc (2) Drainage Pumping Station



The necessary area of the pumping station and the retarding pond are 870 m² and 18,876 m², respectively.

Relocation/resettlement will be carried out in Phase II for the construction of the pumping station and retarding pond. Relocation/resettlement for the temporary dike will be carried out in Phase I.

(5) Intermediate Wastewater Pumping Station

The area of the Intermediate Wastewater Pumping Station is 6,000 m².

The relocation/resettlement will be carried out in the phase I.

(6) Wastewater Treatment Plant

A wastewater treatment plant will be constructed in Binh Chanh District instead of in Nha Be District. The necessary area is 500,000 m².

The relocation/resettlement will be carried out in the phase I.

(7) Conveyance Sewer

A road is prepared in order to construct Conveyance Sewer.

The compensation for agricultural land will be done in the phase I.

1.2 Land Area to be Acquired

Area of land to be acquired for the Project is shown in the following table, including one wastewater pumping station, 3 drainage pumping stations, and 1 wastewater treatment plant, the southern edge and the northern edge (in ward 16 of district 8) of Ben Nghe – Tau Hu Canal, and the conveyance sewer.

Location	Area (m ²)
Pumping Station at Ben Me Coc 1 (Ward 15 District 8)	20,424
Pumping Station at Ban Me Coc 2 (Ward 15 District 8)	19,746
Pumping Station at Dong Dieu (Ward 4 District 8)	6,000
Pumping Station at Thanh Da (Binh Thanh District)*	1,140
Wastewater Treatment Plant (Binh Chanh District)**	500,000
Road and sewer for Conveyance Sewer**	61,800
Ben Nghe – Tau Hu Canal Renovation (Southern edge:	126,753



District 4 and District 8, Northern edge: Ward 16 District 8)	
Total	735,863

* including dike (375 m²), and not including the existing retarding pond

** agricultural land

The area of land to be acquired will be revised by the detailed household survey.

1.3 Number of Houses and Households to be Affected

Based on the initial surveyed document of Department of Land and Housing in July 1999 and Topographic Survey conducted by this project team, the number of houses and households to be affected by the Project were surveyed and estimated by PMU in Nov. 2000. The result of the survey is summarized in the following table. These numbers will be revised after the detailed household survey.

Location	Affected Households	Houses to be Removed/relocated
Ben Me Coc (1) Pumping Station	29	29
Ben Me Coc (2) Pumping Station	32	31
Wastewater Pumping Station at Dong Dieu	48	47
Thanh Da Pumping Station	98	96
Conveyance Route (Binh Chanh District)	20	0
Conveyance Route (District 8)	10	0
Wastewater Treatment Station	60	60
Ben Nghe – Tau Hu Canal Renovation		
District 4	850	850
District 8	1,406	1,298
Total	2,553	2,411

2. Present Situation

The Draft Final Report of Resettlement Action Plan for Ho Chi Minh City Water Environment Improvement Project was prepared in Nov. 5, 1999 and revised in Nov., 2000. The boundary of the Project as shown in section 1.1 will have to be permitted by HCMC PC, and then the practical procedure of relocation and resettlement will be started. The procedure of the relocation and resettlement for this project is shown in the next section.

2.1 Tau Hu – Ben Nghe Canal

According to the 1996 survey data by the Department of Land and Housing, the number of residents on and along Tau Hu – Ben Nghe canal including the tributaries is reported about 65,000 with 7,800 households. Among them, illegal houses account for 80% and most of them encroach on the canal water. Almost half of them have been living in the low level or temporary houses of this area without electricity and water supply services



for more than 20 years. Many houses can be seen constructed on the accumulated garbage in the canal and disturb the storm water drainage and navigation.

Several areas, in which houses have been already relocated in relation to other projects, are found along Tau Hu – Ben Nghe Canal.

2.2 Thanh Da (Site of Pumping Station)

Near the proposed drainage pumping station there is a park and old apartments. There are densely constructed houses within the area for the proposed drainage pumping station.

2.3 Ben Me Coc (1) and Ben Me Coc (2) (Site of Pumping Station)

There is an existing pond which is used as a reservoir of drainage pumping station for Ben Me Coc (1). Houses are scattered around the ponds, a proposed pumping station and a control gate.

Houses are scattered within a proposed reservoir, a proposed pumping station, and proposed control gate for Ben Me Coc (2).

2.4 Dong Dieu (Site of Intermediate Wastewater Pumping Station)

An area for a proposed Intermediate Wastewater Pumping Station is located between agricultural and residential area. The affected area include the densely constructed houses and a lot of graves.

2.5 Area along Proposed Conveyance Sewer (from Intermediate Wastewater Pumping Station to Wastewater Treatment Plant)

A proposed conveyance sewer and road will be constructed in the rice field and fishing ponds area. Houses are scattered and affected houses will be resettled within their land.

2.6 Site for Wastewater Treatment Plant

All houses within area for a proposed wastewater treatment plant are resettled. The land is used as rice fields and fishing ponds. Compensation by land is the best methods for farmers.

3. Legal Framework and Policy

The national and Ho Chi Minh City's policy for the relocation/resettlement is shown in various regulations as shown below.



3.1 Legal Framework

Laws and regulations related to land acquisition, compensation, relocation, and resettlement are as follows:

(1) National Level

- Land Law (Oct., 1993)
- Civil Code (July, 1996)
- Decree No.22/1998/ND-CP (Apr. 24, 1998)
- Circular No.145/1998/TT-BTC (Nov. 4, 1998) of Finance Ministry
- Decree No.87/CP (Aug. 17, 1994) of the Government regulating land price frame.
- Decree No.38/2000/ND-CP (Aug. 23, 2000) of the Government on relocation and resettlement.

(2) City Level

- Decision No. 05/QD-UB-QLDT (Jan. 4, 1995) of HCMC People's Committee issuing land price framework.
- Decision No. 5184/QD-UB-KT (Sep. 11, 1996) of HCMC People's Committee compensating the houses (structures) on standard price of houses to calculate the registration fee multiplying 1.2 coefficient.
- Decision No. 5787/QD-UB-QLDT (Aug. 8, 1998) on managing the apartments to relocate people living on canal.
- Draft regulation on compensation, damage and resettlement assists for HCMC Water Environment Improvement Project, Tau Hu, Ben Nghe – Doi, Te basin sent to Departments to get comments and submitted to HCMC People's Committee to get its approval. This draft regulation is based on Draft Proposal of East – West Highway Project and Drainage System Improvement Project – Hang Bang Basin funded by ADB which is a small part of Tau Hu, Ben Nghe – Doi, Te basin.

3.2 National Policy

Key to the policy of relocation is that all people who are using land legally, are entitled to compensation for their land and property if the State claims their land for national defense, security or national and public interest. Businesses will be entitled to compensation if they have paid the land use tax from non-State budgets. However, illegal users of land will not be principally compensated for their land and property.

(1) Decree No. 22/ND-CP issued in 24 April 1998

Decree No. 90/CP was displaced by Decree No. 22/ND-CP issued in 24 April 1998. Decree No. 22 is the base for determination of region's area to be cleared for national and public purposes. According to this decree, all transportation and infrastructure



projects allow government to appropriate land required. Also, Land Law (1993) and Civil Code (1996) that stipulate the rights and obligation of land users are base of the decree. The new decree highlights further compensation entitlements and subsidies compared to the previous one. The higher prices for urban land is set and the definition of land for public use is broadened.

(2) Circular No. 145/1998/TT-BTC, dated November 4, 1998

Circular No. 145/1998/TT-BTC defines the following items:

- The method for determination of K coefficient in order to define the land price for compensation.
- The content and management mechanism of expenditures for compensation and site clearance
- To formulate and to take part in compensation alternatives for the investe project using capital source from State budget.
- The compensation for various persons and organizations.

(3) Decree No. 87/CP issued 17 August 1994

Compensation costs of land and property are based on minimum and maximum prices determined for five types of land as specified in Decree No. 87/CP. Provinces and cities governed by central government are allowed to set their own land values according to the local conditions, as they fall within the limited ranges. The local district PC is responsible for confirming the land and structure areas affected and the entitlements to compensation.

(4) Decree No. 38/2000/ND-CP issued 23 August 2000

This Decree prescribes the collection of land use levy in cases where organizations, family households and individuals are assigned land by the State, allowed by the latter to change the land use purposes or buy the State-owned dwelling houses, and granted the land use right certificates according to the provisions of the land legislation. In this Decree land price shall be calculated in Vietnamese dong for each square meter (VND/m²) according to the price bracket set by the People's Committees of the provinces and centrally-run cities, based on the Government's price bracket for different land categories.

3.3 HCMC Policy

HCMC PC is responsible for determining a compensation plan including those with who are eligible for compensation and the compensation rates within national policy. There are several provincial regulations that set the procedures for compensation within the national framework. Major projects require special legislation.



(1) Decision No. 05/UB-QLDT issued 4 January 1995

In Decision No. 05/UB-QLDT, PC of HCMC has further specified the prices of urban land in the city, and also mentions percentage rate of land compensation price concerned to legality of land. The price, however, do not necessarily conform to market values. In addition, further regulations have been issued by PC of HCMC to specify in more detail, the compensation costs for property, business loss and damage, and moving fees for the affected people.

(2) Regulation (Decision) on Compensation, Relocation and Resettlement in construction investment project items of HCMC Water Environment Improvement Project (draft)

This regulation (draft) provides the following items for compensation relocation, and resettlement to be derived from HCMC Water Environment Improvement Project:

- Compensation for land;
- Compensation and allowance for damage of assets;
- Other supports apart from the damage compensation or allowance on land and houses; and
- Resettlement for households that have to relocate total land/house.

4. Institutional Framework

4.1 National Level

Providing land use title to proposed construction area with more than 3 ha (the wastewater treatment plant, at Binh Hung ward, Binh Chanh District).

4.2 City Level

(1) HCMC People's Committee

HCMC PC decides lands to be confiscated, and has the overall responsibility for determining the compensation plan, setting its own land values within the broad national range. Within this set of local values, HCMC PC also has the right to apply an adjustment coefficient.

HCMC People's Committee instructs and decides the following issues:

- a. Decides relocation boundary and scope, and accepts construction sites.
- b. Approves the regulations on compensation, damage and resettlement.
- c. Instructs Compensation and Resettlement Council at City Level to solve difficulties from Compensation and Resettlement Councils at District level.
- d. Instructs Department of Planning and Investment to balance the capital source and plan the disbursement schedule for compensation and relocation according to the required schedule of the Project.



- e. Instructs Department of Land and Housing to consider and balance the house fund for the resettlement work of the Project.
- f. Instructs Department of Finance and Pricing to regulate the policy of compensation, damage assists and approves compensation cost estimation.
- g. Instructs HCMC Chief Architect Bureau to identify the relocation boundary and provide the certificate of road boundary planning to the construction sites of the Project.
- h. Instructs Compensation and Resettlement Committee at District Level to implement the duty according to the issued Decree of Government and the issued Decisions of HCMC PC.

(2) Compensation, Relocation and Resettlement Council at City Level

Decree No.22 stipulates the organization responsible for compensation, relocation and resettlement. Under Decision No. 4964QD-UB-VX (1998), HCMC PC has established a Compensation and Resettlement Council at City Level. Compared with previous Decree No. 90, the city authority has a larger power and can cover all projects related to relocation.

Members of this council are listed below. In case that religious facilities are to be relocated, Father Land Front will be added as a member of the Council.

- Chairman: Standing Vice Chairman of HCMC PC
- Member: Department of Land and Housing
- Member: Department of Transportation and Public Works
- Member: Department of Finance and Pricing
- Member: Department of Planning and Investment
- Member: HCMC Chief Architect Office
- Member: Department of Science, Technology and Environment
- Member: Department of Labor, Invalid and Social Affairs
- Member: Department of Construction
- Member: Father Land Front

(3) District PC

District PC is responsible for confirming the land and structure areas affected and the entitlements to compensation. District PC shall be responsible for an option to compensate and relocate people in areas to be cleared when there is a decision of HCMC PC.

(4) Compensation and Resettlement Council at District Level

At the district level, there is also a council for compensation, relocation and resettlement.



Members of the council are listed below:

- Chairman of the Council: a deputy district president is the chair as usual.
- Vice Standing Chairman of the Council: Director or Deputy Director of Water Environment Project Management Unit is the vice standing chairman as usual.
- Vice Chairman of the Council: one person from Department of Finance and Pricing.
- Member: Department of Land and Housing.
- Member: Department of Planning and Investment
- Member: Chief Architect Bureau
- Member: Department of Construction
- Member: Department of Science, Technology and Environment
- Member: Father Land Front.
- Member: Department of Labor, Invalid and Social Affairs.

Functions and duties of Compensation, Relocation and Resettlement Council at District Level are as follows:

- Coordinating compensation, relocation and resettlement activities including consultation, advice, monitoring for compensation and relocation of district level.
- Being delegated by HCMC People's Committee to identify and proclaim the list of households and individual, agencies and other structures having to be removed and relocated in the scope of construction areas.

(5) Project Management Unit (PMU)

The HCMC PC is the responsible agency for the implementation of land acquisition and compensation. Since many departments of the People's Committee are related to the Project, HCMC PC will establish a Project Management Unit (PMU) with a general director who has full responsibility to supervise and manage all the activities relating to the Project implementation and coordinate with other agencies concerned.

PMU will have a division in charge of compensation, relocation and resettlement, implement the duties of the executing agency on behalf of HCMC People's Committee coordinate with Compensation and Resettlement Council for the compensation, and relocation procedure, and receive the site to transfer to the construction agency.

In order to assist PMU in well implementing the duty of establishing the compensation, relocation and resettlement plan and propagating the objectives of the project, the support of relocation and resettlement consultants is required for the following works:

- Establish the resettlement plan.
- Investigate sociology, proposal and expectation of affected people. The information from the investigation will help the authorities and PMU find the best solutions in order that people can settle down fast.
- Educate people the sense of community.
- Evaluate the resettlement sites (conveniences, upgrading people's life, better



accommodation than slums, career response, income, etc.).

- Supervise the implementation of resettlement.
- Evaluate the implemented results, give the proposal to PMU, submit to HCMC People's Committee to revise properly, and give better conditions for next PMU to carry out more conveniently.

(6) Specialized Teams of Compensation and Resettlement Council at District Level and PMU

The Teams are specializing in accountant, technical, relocation policies of districts and PMU. Social workers will participate into this team for HCMC Water Environment Improvement Project.

- Have duty to supervise and speed up the contractors in measuring and drawing the existing and demarcating the relocation boundary, investigating the legal status of houses, sociology and expectation of people, reviewing the list of houses, existing drawing, area having to be relocated, compensation price and other costs. After that, submit to Compensation and Resettlement Council at District Level and PMU before submitting to HCMC People's Committee for issuing Decision and Department of Land and Housing for approving the estimation of compensation cost.
- Participate in negotiating with people about the compensation price and relocation time and make the agreement memorandum between the Compensation and Resettlement Council at District Level and people.
- Participate in payment and drawing the balance sheet of compensation and relocation quantity between the Compensation and Resettlement Council at District Level and PMU, and between PMU and authoritative departments (Department of Finance and Pricing).

(7) Department of Land & Housing

Work concerned with relocation and resettlement is handled by Department of Land & Housing. This department is responsible for coordinating the relocation plan at city level. This includes planning, funding and arranging transfers of funds. This department handles the City Housing Development Fund whose source mainly comes from the sale of state-owned housing. Funds are used for supporting relocation, such as development and repair of housing for the people without enough money.

(8) Others

The work concerning dredging of canals and drainage is handled by Department of Transportation and Public Works. Chief Architect's Office manages projects, supported by Urban Planning Institute (UPI). UPI conducts research on urban planning, being responsible for setting the boundaries for relocation, and proposes projects to Chief Architect's Office. Actual implementation is responsibility of the districts, with



Department of Land & Housing providing technical support, managing and constructing of housing and building, and being also able to move funds between districts.

Department for Labor and War Invalids, Social Affairs is a part of the Compensation and Relocation Council at City Level. It is mainly concerned with implementing the policy of resettlement to New Economic Zones - rural development at some distance. The social aspects of the inhabitants in resettlement sites should be covered mainly by this department, but this activities have not been implemented yet. Also, Department of Education is responsible for the school registration, and transfer of school children after relocation.

5. Procedure of Relocation and Resettlement

Based on the governmental decree on compensation for lost property in the case where the state recovers land for use in national defense, security, national interest, and public interest in Decree No.22/1998/NC-CP and the HCMC PC's policy and instruction in Document No.2553/1999/CV-UB-QLDT, the following steps are proceeded by relevant agencies.

- Flow of relocation and resettlement procedure is shown in Fig. 5.1.
- Schedule for the land acquisition, compensation, and resettlement is shown in Fig 5.2, 5.3, 5.4, 5.5 and 5.6.

Details are described below:

- ① Planning and Preparing Detailed Survey
Plan the detailed house and land survey, the detailed household survey and the participatory rapid assessment.
- ② Relocation Boundary
Based on the approved scope of facilities, estimate the compensation and relocation quantity and relocation boundary to submit to Chief Architect Bureau identifying the planning and relocation boundary. After having the opinions of Chief Architect Bureau, submit to HCMC People's Committee for considering and approving (done by PMU).
- ③ Establishment of Compensation and Resettlement Council.
 - Submit to HCMC People's Committee for issuing the Decision on assigning the Districts to establish Compensation and Resettlement Council and on assigning Departments coordinating with each other to implement.
 - In the case of the resettlement in HCMC, a Compensation and Resettlement Council is established at city and district level. The Project Management Unit (PMU) cooperates closely with the Land and Housing Department to make procedures smooth and efficient since the resettlement caused by the Project is at a rather large scale.
- ④ Based on the compensation and relocation schedule done by the consultants relating to the detailed house and land survey, the detailed household survey and



the participatory rapid assessment, Compensation and Resettlement Council at District Level implements the next steps.

⑤ Detailed House and Land Survey

- Sign with the contractors to demarcate and identify the relocation boundary based on the approved relocation boundary. Unofficially inform to people about the clearance scope, the detailed house and land survey (PMU signs the contract).
- Sign the contract to collect the data of houses and land.
- As soon as the approval of the boundary of the project, the survey will be conducted.
- Products to be submitted are map of existing situation (scale 1/500), land acquisition-handover map (scale 1/500) and technical dossier for a land of each household.
- Make on-site benchmarks.

⑥ Detailed Household Survey

- Investigate sociology and investigate the expectation of people.
- In order to examine socioeconomic situation and legal status of land and structures (mainly houses), a household survey for each household affected by the land acquisition of the project will be conducted by relevant district offices under supervision of the Compensation and Resettlement Committee.
- By conducting the household survey, social aspects such as culture, religion, and people's feelings in the Project area should be grasped and be reflected to the implementation of the compensation and resettlement plan.

⑦ Participatory Rapid Assessment (PRA)

The purpose of the PRA is to identify the relocatees' needs and problems in order to suggest solutions to the problems, in environmental and socio-economic as well as housing aspects.

⑧ Establish the alternatives for compensation and resettlement.

⑨ Data Analyses

- Unite the data of land and house area between people and Compensation, and Resettlement Council at District Level.
- Compensation and Resettlement Council at District Level collect the data and transfer to PMU for considering.
- PMU will analyze data of detailed survey.
- Social worker team will prepare the draft final report of Participatory Rapid Assessment.
- PMU will submit the results from data analyses to Department of Finance and Pricing and HCMC People's Committee for issuing a Decision of population revision and a Decision approving the compensation and relocation alternatives.
- PMU will submit the draft final report of Participatory Rapid Assessment to HCMC People's Committee.

⑩ Set up of Compensation rate for Concerned Items



- Apply the compensation price and make the estimation for compensation to submit to Department of Finance and Pricing to get its approval (done by PMU).
- The Decree 22/1998/ND-CP is used to determine the compensation rates for items to be compensated for such as land, house, structures, and transport costs. Houses of private ownership are compensated at relevant unit price, multiplied with coefficient K, that is land price index, which will be decided by PC's approval of HCMC. Although many households without legal title to the land are living mostly along the canal, the decree prescribed compensation to those households. In this stage, public hearing will be organized.

⑪ Preparation of Land Acquisition

Based on the results of the household survey and the public hearings, the compensation and resettlement action plan is revised with detailed estimation of the compensation costs. Based on the detailed estimation of the compensation cost described in the report approved by PC of Ho Chi Minh City, PMU receives budget for compensation from the Department of Finance. Notice of the compensation amount to households is made by relevant district offices.

⑫ Negotiation

Negotiate with people (including public hearing meeting) and instruct the resettlement sites for them to select and register, sign the payment negotiation and time of relocation (done by Compensation and Resettlement Council at District Level).

⑬ Compensation and Resettlement

- Compensate, resettle, and arrange people to the resettlement sites (done by Compensation and Relocation Council at District Level, division in charge of relocation and resettlement of districts and PMU).
- The housing units in resettlement sites before housing construction starts are checked for relocatees. Relevant districts finalize the list of households by way of resettlement, which are to move to proposed resettlement sites and to resettle by themselves.
- After the negotiation for compensation and resettlement is completed, relocatees sign a house purchase or a rent contract with the House Management Company and decide the time for moving. Then relocatees move into the resettlement site under the agreement with HCMC. Moving expenses into the resettlement site are subsidized for relocatees as part of the compensation cost under the Decree No. 22/1998/NC-CP.

⑭ Solving difficulties

Solve the remaining difficulties in the relocation finished times. Following examples:

- People get the money but do not relocate.
- People have not found the resettlement place yet.
- People do not relocate intentionally.

⑮ Supervise



Supervise the results of relocation and resettlement.

⑩ Recommendation

Conclude and give the additional recommendations to perfect the relocation and resettlement policy for the next projects (done by PMU, Compensation and Resettlement Committees and the consultants).

6. Compensation

6.1 General

Compensation will be provided in cash, by land or by house according to Decree No. 22.

Scope of compensation is;

- Loss of the whole area of confiscated lands stated in Decree No.22
- Loss of properties on confiscated land, including infrastructure
- Subsidizing people and factories that have to be relocated
- Paying fees to confiscated land-owners who have to change their jobs
- Paying the cost of site clearing, moving and allowance

Categories for compensation and unit rates will be shown in a regulation on Compensation and Resettlement in construction investment project items of HCMC Water Environment Improvement Project to be issued by HCMC PC as shown in Annex 1.

6.2 Compensation for Land

Organizations, households, and individuals, whose land is acquired by the Government, will get compensation if they have one of the conditions regulated in Article 6 of Decree No. 22/1998/ND-CP dated 24 April 1998 of the Government. Details are shown in Article 1 of Annex 1.

Organizations, households, and individuals, who will not get land compensation, are shown in Article 2 of Annex 1.

The method of land compensation is shown in Article 3 of Annex 1.

- Unit price for land compensation calculation is applied by the tariff for urban land regulated in Decision No. 5/QD-UB-QLDT dated 04 January 1995 by HCMC PC, to be timed K coefficient.
- The price for urban land in District 4, District 8, and Binh Thanh District is shown in Table 6.1.
- K coefficient is described in Part A (the method for determination of K Coefficient in order to define the land price for compensation) of Circular No. 145/1998/TT-BTC (Nov. 4, 1998) of Finance Ministry as shown in Annex 2.

The compensation for agricultural land is shown in Article 4 of Annex 1. The land and



assets of State offices and other organizations (specialized land) is shown in Article 5 of Annex 1.

6.3 Compensation for House

The compensation for private-owned house is shown in Article 6 of Annex 1. The tariff on house construction regulated in Decision No. 5184/QĐ-UB-KT dated 09 November 1996 of HCMC PC on the issuance of the standard tariff for house value is used in order to calculate registration fee, to be timed with the coefficient 1.2. This decision is shown in Annex 3.

The compensation for house, workshop of enterprises and other organizations is shown in Article 7 of Annex 1. The compensation for households and individuals who are using houses with State-owned origin or houses with the State-budget origin is shown in Article 8 of Annex 1.

6.4 Compensation for Other Assets

House with telephone, water, electric system (registration cost), and well, will be compensated. The compensation is shown in Article 9 of Annex 1.

(1) Telephone

According to the new installation fee or transfer fee by City Telephone Company, the compensation shall be done.

(2) Main electric meter (registration)

According to the new installation fee or transfer fee by City Electric Company, the compensation shall be done.

(3) Water meter (registration)

2,000,000 VND/piece. In case one part of the house is relocated: 400,000 – 500,000 VND/piece will be compensated.

(4) Drilled Well

- 1,500,000 VND/piece (depth under 30 m)
- 3,000,000 VND/piece (depth from 30 m to 50 m)
- 5,000,000 VND/piece (depth from 50 m upward)

(5) Well dug manually



80,000 VND/m of depth.

(6) Other architectural assets

Other architecture is compensated according to the tariff regulated in Decision 5184/QD-UB-KT dated 09 November 1996 by HCMC PC (Annex 3).

6.5 Compensation for Crops and Trees

The compensation for Crops and Trees is shown in Article 10 of Annex 1, and will be applied the standard tariff in the Table 1 of Annex 1. As for the Specialized crops garden, calculation can be increased not more than 50 % of the standard tariff.

6.6 Compensation for graves

The compensation for the movement of grave is shown in Article 10 of Annex 1 and below:

- Soil grave: 1,000,000 VND/grave
- Normal constructed grave by masonry: 1,500,000 VND/grave
- Semi-solid constructed grave: 2,500,000 VND/grave
- Solid constructed grave: 4,000,000 VND/grave
- Transfer grave: 400,000 VND/grave
- Support for grave land: 1,000,000 – 2,000,000 VND/grave

6.7 Other Supports

Other supports are shown in Article 11 of Annex 1. Organizations, households, and individuals who are not belonging to the encroached group, have legal house and have to relocate totally, apart from the damage allowance on land and house, they will get other compensation as follows:

(1) Support on Life

Each member in the permanent registration book at the relocated house will get one-time allowance of 1,000,000 VND. For people who have original registration in the City and had long-term registration at the relocated house and who temporally registered at least 5 years, including target group KT3, will get the same allowance level as permanent register.

(2) Support for the cost of house detachment and transport

- Individual household will get 2,000,000 VND/household of 3rd level house upward and 1,000,000 VND/household of 4th level house, and temporary house.



- Offices will have get support based on the amount and actual cost for the transportation and considered concretely by the District Resettlement Committee.

(3) Support for business/production suspension

For household heads who directly do the business and have valid permit:

- Households with income less than 2,000,000 VND/month will get compensation of 1,000,000 VND/household.
- Households with income 2,000,000 - 4,000,000 VND/month will get compensation of 2,000,000 VND/household.
- Households with income 4,000,000 – 6,000,000 VND/month will get compensation of 3,000,000 VND/household.
- Households with income 6,000,000 – 8,000,000 VND/month will get compensation of 5,000,000 VND/household.
- Households with income 8,000,000 – 10,000,000 VND/month will get compensation of 7,000,000 VND/household.
- Households with income more than 10,000,000 VND/month will get compensation according to actual interest in 6 months, but not less than 8,000,000 d/household.

For enterprises that have to be located

- Enterprises will get 3-months wage allowance according to the suspension allowance for the workers/cadres working at the direct production/business units which have to be relocated.
- Enterprises will get allowance of 3 months actual interest.

(4) Allowance for privileged family

- Vietnamese hero mothers, heros in people's armed force, labor heros will get 5,000,000 VND/household.
- War invalids, fallen soldiers' family (father, mother, husband, wife, children are fallen soldier) will get 3,000,000 VND/household.
- Family with meritorious services to the Revolution and people who are receiving regular social allowance will get 1,000,000 VND/household.
- If in one household, there are many persons entitled to the privileged policy, only one allowance of the highest privilege is applied.

(5) Allowance for training cost due to the acquisition of agricultural land

- If one household is acquired from 30 to 50% of legal agricultural land, one allowance is applied.
- If one household is acquired from 50 to 70% of land, two allowances are applied.
- If one household is acquired more than 70% of land, allowance is applied for the total number of agricultural laborers within the labor age who are registered in the



household registration book.

Training cost level for 1 allowance is 1,000,000 VND.

- (6) Allowance for legal land users (organizations, households and individuals) who well obeyed the policy on detachment and movement

They will get bonus in cash:

- For the case that total house and land is acquired, not more than 5,000,000 VND/household.
- For the case that one part of house and land is acquired, not more than 50% of the bonus level mentioned above.
- For the case that one part of land is acquired (house is not affected) or more than 50% of the agricultural land is acquired, not more than 1,000,000 d/household.

- (7) Allowance for the case that total house, and land is acquired and users want to find the new living place by themselves, and don't want to go to the project resettlement sites

They will get additional support of 20% of the land compensation.

- (8) Household with special difficulties will get special support according to the decision of the project.

6.8 Compensation Cost Estimation

Based on draft regulation on compensation and resettlement in construction investment project items of HCMC Water Environment Improvement Project, the PMU of this project prepared the land acquisition and compensation costs by items with unit costs prescribed by both central and HCMC governments. The results are shown in Table 6.2. After the detailed household survey, the compensation costs will be revised.

7. Special Consideration for Religious Facilities

According to the preliminary survey, five (5) temples/pagodas are to be wholly or partly affected by the project. From its past experience, HCMC pays special considerations to religious facilities to be allocated and following policies will be applied to them although there is no official regulations regarding these policies.

- The land acquisition and compensation are conducted based on religious policies of the government and in accordance with current laws and regulations, which are applied for households and business, to avoid discrimination in the community.
- The relocation of religious structures is not based on the ownership as applied to households, but on the registration status of the structures in the list of religious facilities of the City Religion Board. In practice, relocation of religious structures is considered in case by case taking into account the specific features of those



structures.

- In case of wholly affected, district PCs together with the Father Land Front consult with monks on the land-to-land compensation.
- In case of religious facilities, whose area to be affected over 2/3 of the total, want to relocate wholly, they can enjoy the current policy on compensation as the case of wholly relocation.
- If the religious facilities are listed as historic and/or architecture structure, the City will consider in case-by-case to adjust the plan to preserve the facilities.
- In regard of compensation, for structures with complicated design and decoration, they can propose the compensation to restore the similar design and decoration.

8. Resettlement Sites Development

Resettlement Sites Developments must be finished before the relocation starts. Based on the HCMC Housing Development Program, HCMC Water Environment Improvement Project proposes to resettle the relocated people into 10 sites in Districts 4, 8, Binh Thanh, 7, Binh Chanh. Locations of the resettlement sites are shown in Fig.8.1 and in Table 8.1.

8.1 Cost Estimation for Resettlement Sites Development

Based on the results of the questionnaire to the housing companies, cost for the resettlement sites and its breakdown for the technical and social infrastructure and housing construction are shown in Table 8.2.

8.2 Implementation Program on Construction of Resettlement Sites

(1) Principles

The following principles will be intended in the relocation/resettlement process:

- The affected people must be compensated and recovered in better accommodation or equal to the previous one at least.
- Resettlement sites have enough infrastructure facilities and the construction of infrastructure facilities is funded by HCMC People's Committee.
- Resettlement Plan should collect opinion of the affected people.
- Public involvement
- Household with special difficulties will get special support

(2) Procedure of Resettlement Sites Development

The following procedure is done:

- ① Investigate the current situation of the land lot, estimate the scale of construction and agree on location;
- ② Preliminary negotiation with households in the proposed area on compensation an



- land acquisition is taken;
- ③ Prepare the project to submit to relevant authority for approval, depending on the size of the project;
- ④ After getting the approval, the compensation and land acquisition is proceeded in accordance with current regulations;
- ⑤ Estimate the costs of construction;
- ⑥ Organize the bid of construction package;
- ⑦ Land leveling and construction of packages; and
- ⑧ After the completion of housing construction, the developer coordinates with district PCs, where relocatees come from, to transfer houses.

(3) Schedule of Relocation and Transfer to Resettlement Sites

- ① After the negotiation and agreement is made between household and HCMC, the household moves to resettlement site.
- ② In principle, the resettlement site development will be completed before the relocation starts.
 - In case that relocation needs to be started before the resettlement site development is completed, the relocatees will be moved to a temporary dwellings under the decision of People's Committee of HCMC and the agreement by relocatees at the city's own expense.
 - Intention of residents to be relocated are taken into account the resettlement site development, especially housing construction. For example, those who operate the restaurants and/or shops will prefer to move to ground floor to operate their restaurant and/or shops at apartment in the resettlement site. In this case, custom arrangement of rooms for restaurants and/or shops are needed.
 - In the case where household prefers to find resettlement place by himself, location where the household will move to will be confirmed by district office and payment of the compensation will be made after the confirmation.
- ③ Payment

Decision No. 5787/QD-UB-QLDT is for management of resettlement apartment by the government and relocatees. Additionally, duties and rights of project owners, selling and transferring apartment are regulated. Households who have permanent registration in HCMC and who cannot afford to find new accommodation in other places shall be entitled to purchase one apartment unit or a house in new areas of relocation on the bases of deducing prices of the house and land. Housing prices in the new sites are based upon the floor area of the building. If they buy a new house, the buyers can choose one of the following 4 options.

 - Payment of the entire cost at a time: 10% discount
 - Payment at least 30% of total price at the first and the remainder paid every 3 months within 1 year: 2% discount
 - Payment within 10 years, each year of which pays 1/10 of the cost.
 - Rent



8.3 Present Condition

The present condition of some projects for resettlement sites development is as follows:

- District 4: due to limitation of land fund (high population density is about 54,000 person/km²). There are 3 apartment sites for 415 households. All apartments are nearly completed and arranged some households lived along canal Ben Nghe from Ong Lanh to Calmette Bridge). Meanwhile, district 4 has 13 ha at Phu My Ward, District 7 (this project has got approval and completed compensation), this is done by exchange land lots available infrastructure.
- Binh Thanh District: there is complete apartment A9 Dinh Bo Linh for resettlement This apartment has approval for construction of 186 unit, in which 80 units were constructed in advance and allocated relocatees in district 1. Remaining about 106 units shall be done at the end of this year to resettle relocatees from Thanh Da area of Ward 27, Binh Thanh District.
- District 8 balances housing and land fund to resettle fully as request. District 8 has construction plan of 5 apartment sites:
 - Binh Hung apartment sites constructed 80 units and 60 units shall be done in year 2000.
 - Bui Minh Truc apartment sites at Ward 6 has been constructing has been constructing 120 units an finished at December/2001.
 - Bui Minh Truc apartment sites at Ward 5 having 544 units is opening bid of construction and completion at year 2002.
 - Ba Dinh Apartment sites being warehouse of 2 ha for resettlement site shall be constructed 350 units and completed at the middle year 2002.
 - Resident area at Ward 16 is only constructed infrastructure and exchanged. This project shall be completed at year 2001
- Binh Chanh District: Location has not been determined.

9. Public Involvement

9.1 Public Hearing Meeting

No public meeting to explain the Project and land acquisition has yet been conducted so far because the Project has not yet approved officially. Right after the approval of the alignment of the project by HCMC People's Committee, detailed household survey will be conducted not only to know socioeconomic conditions of households to be affected, also to ask households' preference on resettlement.

The public hearing is organized by each district under supervision of the Department of Land and Housing to collect opinions and wishes from relocatees during preparation of



detailed compensation plan.

9.2 Public Consultation

In general, households to be relocated are not familiar with the compensation and resettlement issues such as purchase of new house in resettlement site, job opportunity after resettlement, and education for children in the resettlement site.

- Therefore, the public consultation service during and after the resettlement will be coordinated by relevant district under supervision of Land and Housing Department.
- Each affected household can express its ideas or opinions on questionnaire which is collected by district People's Committee and is reported to Land and Housing Department.

9.3 Grievance Procedure

Opinions and grievance raised by affected households will be timely collected and carefully incorporated into the compensation and resettlement process.

- Opinions and grievances raised by affected households should be resolved directly by district People's Committee under the supervision of the Compensation and Resettlement Council at City Level.
- Mechanisms and manuals for frequent dispute and grievance resolution will be established based on the recent experiences of resettlement in HCMC, and then staff in charge of compensation and resettlement procedures will be trained in advance.

10. Income Restoration

10.1 Principle

Importance of income restoration for the relocatees and affected people has recently become an international principle on the resettlement for both intentional donors and personnel in charge of the resettlement issues in developing countries as well as the requirement described in the JBIC Environmental Guidelines.

- The income restoration means that relocatees can continue previous job or find a new regular job to keep their income levels at least equivalent to their pre-project income levels. And if possible, it is desirable that income levels for the relocatees should be improved at the resettlement through the Project. In addition the income restoration after resettlement can be an important incentive for relocatees to settle down at the resettlement sites.
- The income restoration is not prescribed in the present laws and regulations relevant to the resettlement though equivalent cost of living for six months is subsidized based on the Decree 22/1998/ND-CP.
- To minimize the inconvenience for the relocatees, the land-use-right tax and



register fees are exempted in case they purchase houses in the resettlement sites.

10.2 Measures for Income Restoration

In the project area, there are many business and employment opportunities that depend on the present location. According to the Households whose livelihood fully depend on present living area are given priority to move the resettlement site near their present location in principle.

Means of income restoration will be paid attention and confirmed for each household to be relocated before the relocation based on the household survey results and public consultation held by relevant district offices. Department of Labor, Invalid and Social Affairs, and District People's Committee will be involved in the Compensation and Resettlement Council to implement the following measures:

(1) Provision of Chance for Continuation of Previous Business and Job

In HCMC as well as other areas in Vietnam, same types of small shops and workshops tend to gather at the same location. And, same tendency is found in the Project area. Therefore, these kinds of small shops and workshops will be relocated to same resettlement sites near present place under their preferences.

There are many small restaurants and shops along the existing road. Those who operate the restaurants and the shops have a priority to move to ground floor to operate their shops in the case where they prefer to move to apartment in the resettlement site.

Market facilities are prepared in most of the resettlement sites. Vendors in project site will have priority to operate their shops in the market of the resettlement sites.

(2) Provision of New Employment Opportunity

Most of those who engage in unskilled work such as unloading in the warehouse or market, work as temporary base. They can have job opportunity during construction period of the Project. HCMC provide training to them during construction period, then new regular job will be introduced to them after the training such as new industrial area in district 7.

(3) Introduction of Business Loan

During the application considering process, the priority will be preserved for those people affected by the Project being in need of Business Loan to restart or newly start their business after the relocation.

(4) Poor Alleviation Fund



The very poor households are listed according to the survey, and they receive support from The Poor Alleviation Fund when they move to the resettlement sites.

(5) Early Provision of Alternative Land for Agriculture

Alternative land for agriculture is provided as compensation under the Decree 22/1998/ND-CP. It is recommended that the alternative land for agriculture should be provided one year or some compensation before the land acquisition because the land preparation for agriculture requires some period to grow crops in same condition.

11. Supervision and Monitoring

HCMC recognizes the importance of the monitoring activity for the resettlement based on the recent experiences of resettlement programs.

- As soon as the procedures for compensation and resettlement start, the Compensation and Resettlement Council at City Level, headed by Vice Chairman of the HCMC People's Committee, supervises the progress of implementation with support of Department of Planning and Investment and Department of Land and Housing.
- Department of Land and Housing has responsibility to collect all the information related to relocation and resettlement, and reports to the Compensation and Resettlement Council at City Level.
- When any problems are found or reported, the gives instructions to the district offices based on the relevant regulations and experiences of the recent resettlement programs.
- After the relocatees move into the resettlement sites, monitoring activity will be implemented periodically by relevant district offices under supervision of the Land and Housing Department to check mainly following items:
 - Settle down at the resettlement sites
 - Relocation and rebuilt of facilities
 - Relationship in community
 - Any grievance and problem
- Monitoring activities are proposed to start from commencement of move to the resettlement site.
- After the completion of the Project, relocatees who are employed in the Project should be monitored whether they find and engage in new job for 3 months.
- Duration of monitoring is supposed to be around 3 years in total to check the above monitoring items and any unexpected things in the resettlement sites.
- The PMU will report JBIC the situation of land acquisition and resettlement for the Project and progress of the Resettlement Action Plan periodically.

12. Social Condition

Relocation/Resettlement Program should be feasible for each household who will be



affected by the Program. Some aspects, which are related to the social and socio-economic conditions of people who live along/on canals, are reviewed below.

12.1 Sociological Terms for Poverty in Ho Chi Minh City

(1) Residential Status

For administrative purposes, Ho Chi Minh City authorities classify residents into four categories, KT1 to KT4, descriptions of each category are detailed below (from Child Labor in Ho Chi Minh City, Save the Children, 1998).

- KT1: Permanent residents with official residence permits
- KT2: (a) People with permanent residence permits in other parts of Ho Chi Minh City, but living in the locality
(b) People with permanent residence permits in the locality but who sold their house and moved elsewhere
- KT3: Migrants from other provinces who have lived in the locality for more than six months and have permanent or stable work. People in this group are provided with temporary residence papers. This category also includes decommissioned army personnel whose residence permits have not yet been transferred back to Ho Chi Minh City after completing their military service.
- KT4: Short-term migrants, seasonal migrants or relatives of official residents. This category also includes foreigners and overseas Vietnamese. This category of residents comprises of many unregistered migrants. Official figures are not accurate, since many of the seasonal migrants do not register and the figures change constantly.

Many social surveys for the households along and on canals indicate that the majority of household living in the areas affected by the relocation/resettlement are KT1, KT2, or KT3 now.

(2) Poverty Reduction in Vietnam

Poverty has declined in Vietnam between 1993 and 1998. This is represented quantitatively by rising per capita expenditures and improving social indicators and is also reflected by the perceptions of poor households recent years. Rapid, economic growth lies at the heart of these achievements. The incidence of poverty in the rural area has declined from 66 % to 45% between 1993 and 1998. On the other hand, that in the urban area has also declined from 25% to 9% during these years. Therefore, there is still a large discrepancy of social economic condition between the urban and the rural areas (from Attacking Poverty, Vietnam Development Report 2000, Dec. 1999).

This socio-economic discrepancy between rural areas and urban areas induces the migration from the rural areas to the urban area.



(3) Internal Migration

The major concern of the authorities about the large number of migrants coming to the cities is that most do not have prior legal permission to move into the city. In HCMC immigrants without permission to move are accounted for only 37 percent of migrants in the period 1986-1990 but 80 percent in the period 1991-1995.

Most of those without permanent residence status had other forms of registration. Almost 27 percent of the Ho Chi Minh City migrants had long-term temporary residence while another 55 percent had short-term temporary residence.

There are clear rules for obtaining permanent residence.

- These rules favor those with higher levels of education and qualifications, and those working in the state sector.
- Permanent residence can also be obtained through marriage to a permanent city resident.

Therefore, those most likely to intend to apply were the more educated. Most had not yet applied because they still did not meet the conditions.

With the abolition of the subsidy system in the mid-1980s permanent residence became a much less important requirement for day to day living in the city. Theoretically a permanent residence permit is not required for access to basic services such as health and education (from *The Dynamics of Internal Migration in Vietnam*, Dec. 1998, UNDP).

Now, the young migrants from provinces enter into the new industrial zones, where there are many joint venture factories. There are a lot of low-paying jobs for non-skilled workers. However, these jobs are not attractive to the urban residents in the Ho Chi Minh City, because the dwelling condition is not good and it is far from the City Center (from *Child Labor in Ho Chi Minh City*, Sep. 1998, Save the Children).

(4) Urban Poverty

Although the incidence of poverty in urban areas is less than 10 percent, urban poverty was found to be a particularly harsh and complex phenomenon. Migrants are probably not fully captured in the poverty statistics, with the result that urban poverty estimates may be underestimated by as much as five percentage points, so that urban poverty could be in the range of 10-15 percent.

The following characteristics are the most important and most commonly stated factors leading or contributing to poverty:

- Inherited poverty, i.e. being born poor;



- Low levels of education and early dropping out of school;
- Lack of marketable skills or business know-how;
- Unskilled and unstable jobs, with low and irregular pay;
- Lack of resources: capital, social and economic connections and contacts, house, land;
- Large families having many children and few breadwinners;
- Migration and/or a lack of permanent residence status;
- The chronic illness or disability of main breadwinner(s), or a serious illness of any family member;
- Indebtedness to private moneylenders;
- Alcoholism, gambling or drug use;
- Old age, inability to work and lack of family support;
- Social isolation, lack of supportive contacts, friends or relatives; and
- Low energy levels and passive or defeatist attitudes.

These poor people live on black canals, on boats, and in squatter areas. People living along black canals have difficulties to access to utilities, such as electricity and drinking water. People living on boats are not considered as part of the community and are excluded from government services.

Poor Households make a living as following jobs:

- Street vendors
- Cyclo drivers
- Porters
- Selling Lottery Tickets
- Recycling papers and plastics
- Scavenging Garbage

(from Child Labor in Ho Chi Minh City, Sep. 1998, Save the Children)

(5) Hunger Eradication and Poverty Alleviation Program (HEPR)

Hunger Eradication and Poverty Reduction (HEPR) loans are reaching much households (e.g. 16% of households in district 8 have benefited from HEPR program). Poverty alleviation covers more than provision of credit and includes support for repairing or building house, free health care and education fee exemptions.

On the other hand, not all needy families are reached by the program. Credit is only available for income generating activities (not for consumption). Furthermore, too much paper work for applications, and lengthy loan approval process are necessary. People are mostly passive recipients and not active participants in shaping the program.
(from Child Labor in Ho Chi Minh City, Sep. 1998, Save the Children)

(6) Formal and Informal Sector



Informal private business are those that are not formally registered or regulated, do not follow existing labor laws or pay taxes. The informal private sector can make up a significant proportion of the overall economy of a particular district. Local authorities have some records pertaining to these establishments, although they often do not have details of number, age and payment of workers.

The informal enterprises generally use the cheapest available raw materials (recycled plastic, glass, paper etc.) and cheap and locally-made machines. They produce lower quality goods and sell at low prices for consumers with less purchasing power. Typical examples are factories producing goods made from recycled glass, plastic or paper, such as ball-point pen factories. These enterprises work in a very competitive market and profit margins are small, forcing enterprise owners to search for the cheapest available laborers, who are often children, women and/or unregistered migrants.

Formal manufacturing enterprises have certain legal requirements that they adhere to in their recruitment procedures, including the need to supply birth certificates and certification of technical skills. This makes it difficult for children, particularly migrants, to be selected for employment in the formal enterprises, as many do not have these papers or do not bring them to the city when they migrate.

(from Child Labor in Ho Chi Minh City, Sep. 1998, Save the Children)

12.2 Social Survey of Relocation and Resettlement

The social survey was conducted from 2 November to 16 November 1998. Based on the above objectives and targets of the survey, 1,098 households were randomly selected from the study area of Master Plan of this project.

12.2.1 Objective

The objectives of this survey are:

- To understand living conditions of the households along the canals, in the slum areas, on-site resettlement and off-site settlement areas,
- To assess existing relocation programs of the people and understand desire of people through options of relocation at surveyed areas, and
- To understand the level of environmental awareness, especially with quality of canal, of local people.

Construction of drainage and sewerage system is required urgently for environmental improvement and better living condition in HCMC. The result of analyzing and assessing this survey is a background for setting up a relocation option and cost estimation for land acquisition and relocation program in case of construction of facilities.

The target areas are,



- (a) On and along the major canals,
- (b) Slum area away from canals, and
- (c) On-site and off-site resettlement areas.

The former two areas are selected based on the government policy of relocating those inhabitants and also on the fact that they are major factors of environmental degradation of the city. The 3rd area is necessary for assessment of the present relocation policy. Among the 3 areas, there are three kinds of group such as (a) Inhabitants who should be relocated in future but no concrete plan presented yet by the authority, (b) Inhabitants who already agreed with relocation and waiting for new accommodation is ready, and (c) Inhabitants who have already resettled in the resettlement sites.

12.2.2 Items of the Survey

Following items of social survey were studied:

(1) Living Conditions

- Age of all members of sampled households
- Sex of all of sampled respondents
- Birth place of all members of sampled households
- Education level of all members of sampled households

(2) Residential Status and Land Use Right

- Legal status of land use and houses
- Residential status of all members of households

(3) Housing Condition

- Legal status of house
- Years of living in the present place
- Purchase price of houses in resettlement sites
- Domestic facilities owned by sample households
- Reasons for living in the present place
- Problems with living in the present place
- Way to get house

(4) Income and Expenditures of Household

- Monthly Income per household
- Income change after relocation
- Annual Expenditure per household



(5) Water, Wastewater and Solid Waste

- Main water source
- Place for wastewater discharge
- Type of toilets

(6) Environmental Problems

- Environmental problems around houses
- Reasons and ways to clean canals
- Place of discussion on environment improvement
- How to improve canal cleanliness
- Best way for environmental improvement
- Reasons for Cleaning Canals

(7) Opinions for Relocation/Resettlement

- Relocation package preferred by households without plan of relocation
- Responses for living in the present place on and along canals
- Relocation package preferred by households without relocation plan
- Concerns after relocation
- Length to find jobs after relocation
- Reasons to move live in the present place for households on-site and off-site resettlement areas

The results of the survey are shown in Annex 4.

12.2.3 Findings

- (a) Since the share of female population and female head of household are larger than that of male, it is better that women will be provided with environmental education and information related to relocation for effective promulgation.
- (b) The rate of permanent residency is higher and that of illegal residency is lower than expected. However, regarding legal status of land use and house ownership, small population has legal documents for land use and house. This result is similar to the results of Department of Land & Housing, and it is related largely to the compensation policy.
- (c) Since length of living in the present area is quite long, it may make relocation difficult and compensation complicated.
- (d) The purchase price of house in resettlement sites is quite high, especially for low-income households. This repayment per year accounts for 22-44% of total annual expenditure.



- (e) The disparity of income level per household is very large. It depends on the family size and major income sources. The relocation policy should be considered with diversification of housing type and cost based on this result.
- (f) The percentage of labor force (from age 18-55) in the study area accounted for 64% of the total surveyed population. This means that there is a rather high dependency ratio of households (21% of dependent children and 6% of old-retired and 7% of unemployed that are dependent on other members per household). The difference in dependency ratio as well as work force ratio between the areas is not remarkable. However, in observation of the work force group, it should be noted that the skilled laborers are not many. The relocation policy, therefore, should consider the unskilled laborers when moving them to any new resettlement areas. A relevant resettlement policy for relocatees should be combined with an employment policy including vocational training program.
- (g) Families who discharge wastewater into canal/river are many. Even after relocation the houses connected with sewer in the resettlement site, some continue this behavior. For the people, the canal/river system is important as place for disposal of wastewater and solid waste, in spite of their recognition that these activities are major source of water pollution. Therefore, appropriate environmental awareness for the people is essential.
- (h) People recognize the necessity of cleaning canals nearby and willing to help through stopping garbage throwing into canals (by self awareness increase) and even paying fee for cleaning. However, as general environmental improvement in HCMC, people rely on government.
- (i) Major information sources are mass media and PR by the government. In order to increase environmental awareness of the people and relocation policy, these measures should be fully utilized.
- (j) The people who have already resettled and agreed with relocation generally understand the purpose of relocation and try to follow government instruction and regulation, even if they have disagreed with compensation.
- (k) The people concern social issues after relocation as well as economic condition. They are afraid of decrease of income. Therefore, the relocation policy should be planned carefully with consideration of socioeconomic conditions of the people.

12.3 Household Survey conducted by District 4 in 2000

A household survey, which has been conducted by District 4, is done in order to estimate the compensation cost.

(1) Compensation Cost Estimation

Compensation cost for relocation/resettlement of each household along and on Ben



Nhge Canal has been reported by District 4. The distribution of the compensation cost is shown in Table 12.1.

(2) Unit Price of an Apartment in the Resettlement Site

The unit price of an apartment to be sold in resettlement area for district 4 is shown in Table 12.2. If the area of apartment is 60 m², the price of apartment is shown in the Table 12.2.

(3) Income level of Household

The income level of household in Canal System is shown in Table 12.3 (from the social survey in Master Plan Stage) .

(4) Feasibility of Relocation/Resettlement

The relocation/resettlement management should be operated under the condition where relocation/resettlement for each family is feasible. The socio-economic condition of household depends on the following factors:

- Compensation
- Present Income Level
- Household number
- Workforce number of Household
- Others

Households are categorized as below:

- Category 1: Households can buy a ground floor apartment with one payment (for example, their compensation is more than 200 million VND).
- Category 2: Households can buy higher floor apartment with one payment, or they can buy lower floor apartment by installment within 10 years (for example, their compensation is from 100 to 200 million VND).
- Category 3: Households can buy higher floor apartment by installment within 10 years (for example, their compensation is from 40 to 100 million VND).
- Category 4: Households can rent the higher floor apartment (for example, compensation is less than 40 million VND, but the income level is sufficient high to rent).
- Category 5: Households cannot rent the lowest-cost apartment constructed in the resettlement sites (compensation is less than 40 million VND, and income level is not sufficient to rent).

(5) Mitigation Methods for Each Categories



Following mitigation items for each category should be considered.

- Category 1
 - Business chance
 - Loan for economic activity
 - Employment
- Category 2
 - Employment
 - Business chance
 - Loan for economic activity
 - Training for getting a new job which will bring them higher income.
- Category 3
 - Employment
 - Training or new job which will bring them higher income.
- Category 4
 - Training or new job which will bring them higher income.
 - Appropriate low cost housing.
 - Hunger Eradication and Poverty Alleviation Program
- Category 5
 - Appropriate low cost housing.
 - Training or new job which will bring them higher income.
 - Hunger Eradication and Poverty Alleviation Program
- Households which only consist of old persons or handicapped person.
 - Appropriate low cost housing
 - Community Participation System for helping them
 - Hunger Eradication and Poverty Alleviation Program

12.4 Participation of Social Workers

12.4.1 Introduction

Two basic principles for relocation/resettlement should be followed:

- (a) after relocation life for the affected people should be the same or better than before; and
- (b) there must be discussions with the people, since they are the ones affected by these projects. As a general rule, communities and poor people should be involved in urban planning.

It is possible that a lot of difficulties and problems for the affected people may occur during relocation/resettlement process as shown below:

- Insufficient compensation for some affected people



The families who live on the land that is earmarked for clearance are mostly very poor. When they are forced to leave their homes, those who have legal ownership of their houses are given compensation, which may or may not be enough to enable them to move into a reasonable house or apartment in a reasonable locality. Those who are tenants and those who brought or put up houses unofficially, receive no compensation at all. That was the risk they took, when they settled in the area, and so they no ground complaint.

- Insufficient information for some affected people

Often communities slated for urban development and resettlement are not fully informed about the plans. There should be a limit to the areas slated for urban development and conditions and plans should be made clear to everybody. In some cases, there are insufficient information on supporting program.

- Unstable life in the new resettlement site for some affected people

It has been reported that following relocation few people continue to live in the new apartment because they are too poor to stay there and must relocate again in order to earn a living. Employment is therefore more important than housing. The poor also often sell their new apartment and return to the slums in order to maintain vital social ties. Relocation should not be driven only by an environmental agenda, but should give equal consideration to poor people's economic and social concerns. There is a need for more research on relocation programs and their impact on poor people in Ho Chi Minh City.

Social workers will be involved during relocation and resettlement process in order to solve above difficulties.

12.4.2 Roles of Social Workers

Social workers participates in several steps during relocation and resettlement. These steps are as follows:

① Planning

The plan of social workers' involvement is made by high level experts in social field of Ho Chi Minh City (planner) in order to mitigate negative impact of resettlement. The responsibility of the planner is to review plan of detailed household survey, and plan of assessing the problems during appropriate hearing of opinions of project-affected-people in order to implement public involvement by social workers.



② Implementation

- Announcement of relocation (at detailed household survey)
 - Unofficial announcement on relocation
 - Monitor and assess results induced from unofficial announcement on method of compensation and resettlement sites and schedule.
 - Assist the Compensation, Relocation, and Resettlement Councils at District Level in informing affected people on relevant laws and regulations concerning land acquisition, compensation and resettlement.
- Participatory Rapid Assessment (PRA)
- Updates of Relocation/Resettlement

Before land acquisition and relocation/resettlement, social workers shall assist the Compensation, Relocation and Resettlement Council at District Level on the updates of land acquisition and relocation/resettlement schedule.
- Announcement of Land Acquisition

The social workers shall participate in meeting held by the Compensation, Relocation and Resettlement Council at Ward Level in order to inform the relocatees on land acquisition, compensation, relocation and resettlement. The social workers shall make the relocatees understand the legal procedures related to the decision on resettlement and land acquisition.
- Public Hearing Meeting

The social workers shall participate in public hearing meeting in order to collect opinions and wishes from relocatees during preparation of detailed compensation plan and resettlement plan.
- Negotiation of Compensation and Resettlement

In order to solve problems in negotiation for compensation and resettlement between Compensation, Relocation and Resettlement Council and the project-affected people, the social workers shall input information and counsel them on the justification related to the compensation and resettlement.
- Public Consultation

Social workers collect opinions from the project-affected people in Public Hearing Meeting, Negotiation, Detailed Household Survey, Participatory Rapid Assessment, Grievance Procedure and so on before, during, and after the resettlement.
- Grievance Procedure

Social workers shall participate in the grievance procedure to collect opinions and grievance raised by affected households in order to carefully incorporate them into the compensation and resettlement process.
- Community Development



Based on the results of the PRA and Detailed Survey by the PMU, community development is implemented to ensure the sustainability of resettlement work by educating the affected people the benefits of improving living environment, concept of settle-down, self-management in the new resettlement living quarters.

- Assessment on Resettlement Procedure

The social workers shall assess resettlement works and living conditions of the new dwellers in the resettlement sites.

③ Recommendation

The social workers shall submit recommendation on compensation, relocation and resettlement process to PMU and HCMC PC.

TABLE 6.2 COMPENSATION AND RESETTLEMENT COST

Unit: million VND

No	Category	Unit	Number	Unit Price	District				Total
					4	8	B.T.	B.C.	
1	House 2nd	m2	5,100	1.440	7,344				7,344
			8,430	1.440		12,139			12,139
	3rd	m2	17,000	0.720	12,240				12,240
			28,100	0.720		20,232			20,232
			1920	0.720			1,382		1,382
			1200	0.720				864	864
	4th	m2	42,500	0.420	17,850				17,850
			70,250	0.420		29,505			29,505
			4,608	0.420			1,935		1,935
			2,880	0.420				1,210	1,210
2	Land	m2	51,000	2.600	132,600				132,600
			110,161	2.300		253,370			253,370
			14,338	0.110		1,577			1,577
			1,140	1.700			1,938		1,938
			552,300	0.080				44,184	44,184
3	Electric meter	No.	425	1.500	638				638
			703	1.500		1,055			1,055
			48	1.500			72		72
			30	1.500				45	45
4	Water meter	No.	340	2.000	680				680
			562	2.000		1,124			1,124
			19	2.000			38		38
			12	2.000				24	24
5	Telephone	No.	340	1.800	612				612
			422	1.800		760			760
			19	1.800			34		34
6	Relocation allowance	family	850	2.000	1,700				1,700
			1,405	2.000		2,810			2,810
			96	2.000			192		192
			60	2.000				120	120
	Stabilization allowance	person	4,250	1.000	4,250				4,250
			7,025	1.000		7,025			7,025
			480	1.000			480		480
			300	1.000				300	300
	Loss of business	family	425	8.000	3,400				3,400
			703	8.000		5,624			5,624
	Crops and trees		14,338	0.028		401			401
			552,300	0.025				13,808	13,808
	Reward for family who move in time	family	850	5.000	4,250				4,250
			1405	5.000		7,025			7,025
			96	5.000			480		480
			60	5.000				300	300
	Sub-total (I)				185,564	342,647	6,552	60,854	595,617
	Spare cost for house				9,278	17,132	328	3,043	29,781
	5% of sub-total (I)								
	Cost for removing underground work				1,763	2,914	199	124	5,000
	Sub-total (II)				196,605	362,694	7,079	64,021	630,398
	Service cost for compensation and clearance				3,932	7,254	142	1,280	12,608
	2% of Sub-total (II)								
Total					200,537	369,947	7,220	65,301	643,006

TABLE 8.1 HOUSING PROJECTS FOR RELOCATION AND RESETTLEMENT

	Projects	Investors	Area (m2)	Apartments	Exchanged House Foundation
	District 4		138,382	625	425
1	C3 Building, ward 6 District 4	Housing Management & Development of District 4	1,629	105	0
2	B4 and B5 Buildings, Ward 3, district 4	Housing Management & Development of District 4	3,753	310	0
3	Phu My residential Place, District 7	Housing Management & Development of District 4	133,000	210	425
	Binh Chanh District		50,000	0	60
4	Binh Hung Commune Residential	Binh Chanh District	50,000	0	60
	District 8		183,029	1,354	300
5	Binh Dang Residential Place, ward 6, district 8	Housing Developmental & Commercial Company	4,968	140	0
6	Bui Minh Truc Residential Place, ward 5, district 8	Housing Development Service Company/ Dist.8	66,713	544	0
7	Bui Minh Truc Residential Place, ward 6, district 8	Tan Binh Dong Company	9,348	120	0
8	Residential Place, Ward 16, District 8	Housing Development Service Company/ Dist.8	100,000	200	300
9	481 Ben Ba Dinh St., Ward 6, district 8/the storage	General Company of River-Ways	20,000	350	0
	Binh Thanh District		2,476	106	0
10	A9 Building, Dinh Bo Linh	Housing Development Company of Binh Thanh District	2,476	106	0

TABLE 8.2 COST FOR RESETTLEMENT SITES DEVELOPMENT

(Unit: Million VND)

Proposed Resettlement Site	Land Acquisition And Compensation	Technical Infrastructure	Social Infrastructure	Housing Construction	Others	Total
District 4						
C3 Building, ward 6 District 4	2,700	2,392	1,500	9,377	1,027	16,996
B4 and B5 Buildings, Ward 3, district 4	1,488	2,000	1,000	23,923	2,540	30,951
Phu My residential Place, District 7	10,702	40,057	0	13,272	4,315	68,346
Binh Chanh District						
Binh Hung Commune Residential	3,390	11,971	0	0	1,037	16,398
District 8						
Binh Dang Residential Place, ward 6, district 8	1,190	1,700	0	13,332	558	16,780
Bui Minh Truc Residential Place, ward 5, district 8	4,299	8,115	2,292	54,076	5,745	74,527
Bui Minh Truc Residential Place, ward 6, district 8	692	1,300	369	8,706	925	12,000
Residential Place, Ward 16, District 8	2,807	5,299	1,496	38,446	652	48,700
481 Ben Ba Dinh St., Ward 6, district 8/the storage	5,560	4,925	3,090	19,316	2,109	35,000
Binh Thanh District						
A9 Building, Dinh Bo Linh	1,100	1,120	0	8,920	500	11,640
Total	33,928	78,879	9,747	189,356	19,408	331,338

**TABLE 12.1 DISTRIBUTION OF
COMPEN-SATION COST FOR HOUSEHOLDS
ALONG/ON BEN NGHE CANAL IN DISTRICT 4**

Compensation Cost (million VND)	Household Number
0 – 5	16
5 – 10	75
10 – 15	70
15 – 20	79
20 – 30	72
30 – 40	60
40 – 60	103
60 – 80	69
80 – 100	66
100 – 150	122
150 – 200	61
200 – 300	39
300 – 400	14
400 – 500	4
500 – 600	1
600 -	5

(Source: District 4, Feb 2000)

**TABLE 12.2 APARTMENT PRICE TO BE SOLD IN RESETTLEMENT
SITE FOR DISTRICT 4**

Floor	Unit Price (1000 VND/m ²)	Price for 60 m ² apartment (1000 VND)
Ground Floor	3400 - 3,550	204,000 - 213,000
1 Floor	2,600 - 2,750	156,000 – 165,000
2 Floor	2,250 - 2,400	135,000 - 144,000
3 Floor	1,950 - 2,100	117,000 – 126,000
4 Floor	1,680 - 1,830	100,800 – 109,800

**Table 12.3 Monthly Income per Household on and along Canal
(Appendix I Table I.2.14 in Supporting Report on Urban
Drainage and Sewerage System for HCMC)**

Income level (million VND)	Households	%
<1	233	25.9
1 – 2	360	40
2 – 3	130	14.4
3 – 4	56	6.2
4 – 5	31	3.4
5 – 6	12	1.3
>6	27	3
Unknown	51	5.7
Total	900	100

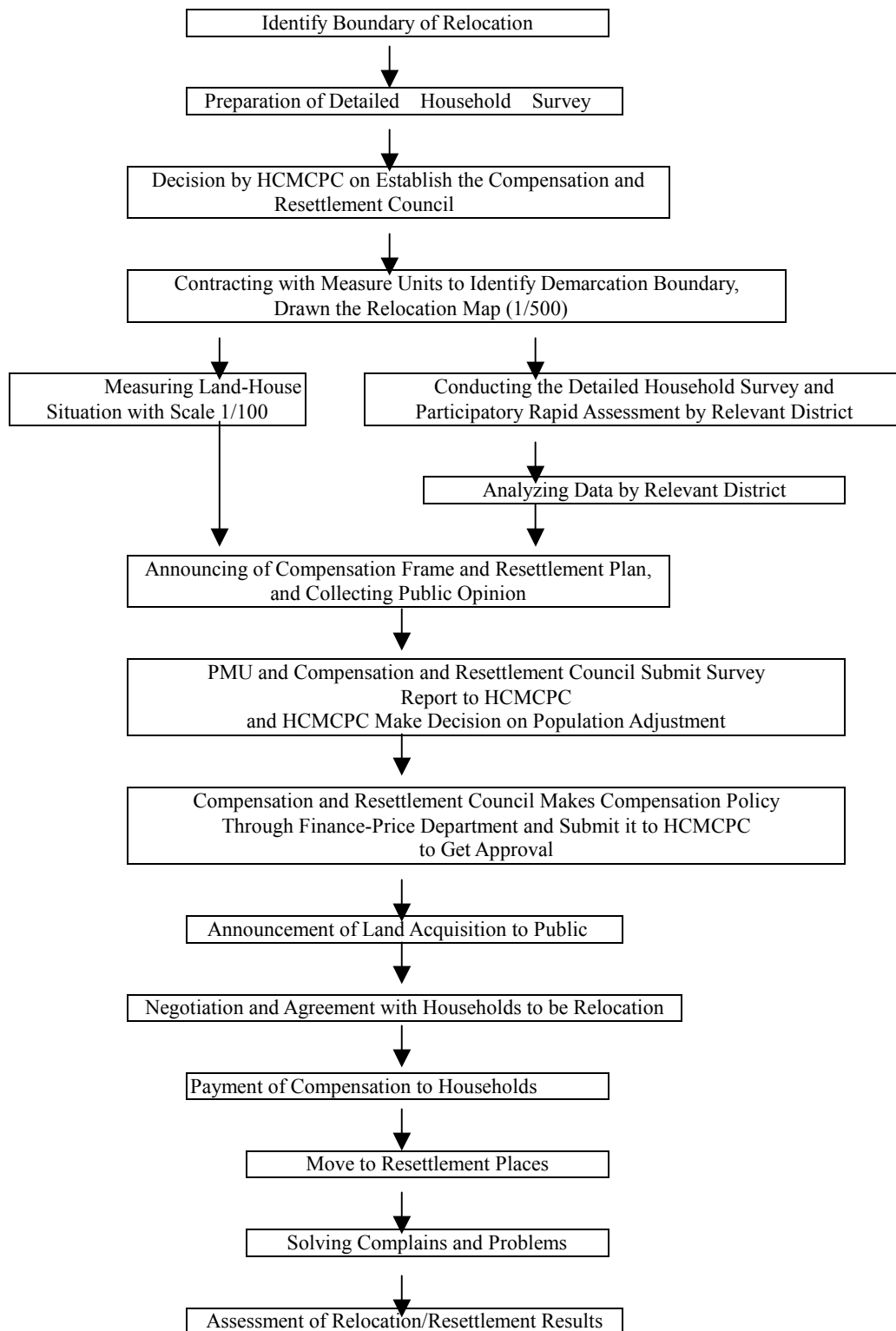


FIG. 5.1 PROCEDURE PROCESS OF RELOCATION/RESETTLEMENT

Calculation Sheet for Compensation Cost (1)

Unit: million VND

No	Category	Unit	Number	Unit Price	District				Total
					4	8	B.T.	B.C.	
1	House 2nd	m2	5,100	1.440	7,344	12,139			7,344
			8,430	1.440					12,139
	3rd	m2	17,000	0.720	12,240	20,232	1,382	864	12,240
			28,100	0.720					20,232
			1920	0.720					1,382
			1200	0.720					864
	4th	m2	42,500	0.420	17,850	29,505	1,935	1,210	17,850
			70,250	0.420					29,505
			4,608	0.420					1,935
			2,880	0.420					1,210
2	Land	m2	51,000	2.600	132,600	253,370	1,938	44,184	132,600
			110,161	2.300					253,370
			14,338	0.110					1,577
			1,140	1.700					1,938
			552,300	0.080					44,184
3	Electric meter	No.	425	1.500	638	1,055	72	45	638
			703	1.500					1,055
			48	1.500					72
			30	1.500					45
4	Water meter	No.	340	2.000	680	1,124	38	24	680
			562	2.000					1,124
			19	2.000					38
			12	2.000					24
5	Telephone	No.	340	1.800	612	760	34		612
			422	1.800					760
			19	1.800					34
6	Relocation allowance	family	850	2.000	1,700	2,810	192	120	1,700
			1,405	2.000					2,810
			96	2.000					192
			60	2.000					120
	Stabilization allowance	person	4,250	1.000	4,250	7,025	480	300	4,250
			7,025	1.000					7,025
			480	1.000					480
			300	1.000					300
	Loss of business	family	425	8.000	3,400	5,624			3,400
			703	8.000					5,624
	Crops and trees		14,338	0.028		401		13,808	401
			552,300	0.025					13,808
	Reward for family who move in time	family	850	5.000	4,250	7,025	480	300	4,250
			1405	5.000					7,025
			96	5.000					480
			60	5.000					300
	Sub-total (I)				185,564	342,647	6,552	60,854	595,617
	Spare cost for house				9,278	17,132	328	3,043	29,781
	5% of sub-total (I)								
	Cost for removing unerground work				1,763	2,914	199	124	5,000
	Sub-total (II)				196,605	362,694	7,079	64,021	630,398
	Service cost for compensation and clearance				3,932	7,254	142	1,280	12,608
	2% of Sub-total (II)								
Total					200,537	369,947	7,220	65,301	643,006

Calculation Sheet for Compensation Cost (2)

Unit: million VND

No	Category	Unit	Number	Unit Price	District								Total
					4				8				
					Canal (Phase I)	Canal * (Phase II)	Ben Me Coc 1 (Phase I)	Ben Me Coc 2 (Phase II)	Dong Dieu (Phase I)	Conveyance (Phase I)	B. T. Thanh Da (Phase I)	B.C. Conveyance (Phase I)	WWTP Phase I)
2	Land	m2	51,000	2.600	132,600								132,600
		m2	69,671	2.300									160,243
		m2	16,016	2.300		36,837							36,837
		m2	1,611	2.300			3,705						3,705
		m2	16,863	2.300				38,785	13,800				38,785
		m2	6,000	2.300				532					13,800
		m2	4,838	0.110						1,045			532
		m2	9,500	0.110							1,938		1,045
		m2	1,140	1.700								4,184	1,938
		m2	52,300	0.080									4,184
		m2	500,000	0.080									40,000
	Total for land (B)				132,600	36,837	3,705	39,317	13,800	1,045	1,938	4,184	40,000
													433,669
	Crops and trees	m2	4,838	0.028				135					135
		m2	9,500	0.028						266			266
		m2	52,300	0.025								1,308	1,308
		m2	500,000	0.025									12,500
	Total for crops and trees (C)				0	0	0	135	0	266	0	1,308	12,500
													14,209

* East bank of Ngang No.2 canal and both banks of Ngang No.1 canal

Calculation Sheet for Compensation Cost (3)

Unit: millionVND

No	Category	Unit	Number	Unit Price	District				Total
					4	8	B.T.	B.C.	
1	House 2nd	m2	5,100	1.440	7,344	12,139	1,382	864	7,344
			8,430	1.440					12,139
	3rd	m2	17,000	0.720	12,240	20,232	1,382	864	12,240
			28,100	0.720					20,232
	4th	m2	1920	0.720	17,850	29,505	1,935	1,210	1,382
			1200	0.720					864
			42,500	0.420					17,850
			70,250	0.420					29,505
			4,608	0.420					1,935
			2,880	0.420					1,210
3	Electric meter	No.	425	1.500	638	1,055	72	45	638
			703	1.500					1,055
			48	1.500					72
			30	1.500					45
4	Water meter	No.	340	2.000	680	1,124	38	24	680
			562	2.000					1,124
			19	2.000					38
			12	2.000					24
5	Telephone	No.	340	1.800	612	760	34		612
			422	1.800					760
			19	1.800					34
6	Relocation allowance	family	850	2.000	1,700	2,810	192	120	1,700
			1,405	2.000					2,810
			96	2.000					192
			60	2.000					120
	Stabilization allowance	person	4,250	1.000	4,250	7,025	480	300	4,250
			7,025	1.000					7,025
			480	1.000					480
			300	1.000					300
	Loss of business	family	425	8.000	3,400	5,624			3,400
			703	8.000					5,624
	Reward for family who move in time	family	850	5.000	4,250	7,025	480	300	4,250
			1405	5.000					7,025
96			5.000	480					
60			5.000	300					
Total (A)					52,964	87,298	4,614	2,863	147,738

Calculation Sheet for Compensation Cost (4)

District		(million VND)									
		Number of house to be resettled	Total (A)	For Land (B)	For Crop and Trees (C)	Total (D) D=A+B+C	Spare Cost E=0.05*D	Removing under- ground work (F)	Total (G) G=D+E+F	Service cost H=0.02*G	Total (I) I=G+H
District 4	Canal (Phase I)	850	52,964	132,600	0	185,564	9,278	1,763	196,605	3,932	200,537
District 8	Canal (Phase I)	1,405	87,298	254,947	401	342,646	17,132	2,914	362,692	7,254	369,946
	Canal (Phase II)	1,184	73,566	160,243	0	233,809	11,690	2,456	247,956	4,959	252,915
	Ben Me Coc 1 (Phase I)	114	7,083	36,837	0	43,920	2,196	236	46,353	927	47,280
	Ben Me Coc 2 (Phase II)	29	1,802	3,705	0	5,507	275	60	5,842	117	5,959
	Dong Dieu (IWPS) (Phase I)	31	1,926	39,317	135	41,378	2,069	64	43,511	870	44,382
	Conveyance (Phase I)	47	2,920	13,800	0	16,720	836	97	17,654	353	18,007
Binh Thanh	Thanh Da (Phase I)	96	4,614	1,938	0	6,552	328	199	7,079	142	7,220
Binh Chang	Conveyance (Phase I)	60	2,863	44,184	13,808	60,855	3,043	124	64,022	1,280	65,302
	WWTP (Phase I)	60	2,863	40,000	12,500	55,363	2,768	124	58,255	1,165	59,420
Total			147,739	433,669	14,209	595,617	29,781	5,000	630,398	12,608	643,006

Compensation Cost for Phase I

Type		Compensation Cost (million VND)
Drainage		466,631
	Canal	453,452
	Improvement	
	District 4	200,537
	District 8	252,915
	Drainage	13,179
	pumping	7,220
	station	5,959
	Ben Me Coc 1	
Sewage		84,713
	Conveyance	7,286
	sewer	
	District 8	1,404
	Binh Chang	5,882
	IWPS	18,007
	WWTP	59,420
Total		551,344

Compensation Cost for Phase II

Type		Compensation Cost (million VND)
Drainage		91,662
	Canal	
	Improvement	
	District 8	47,280
	Drainage	
	pumping	
	station	44,382
	Ben Me Coc 2	
Sewage		0
Total		91,662

Cost for Resettlement Sites Development

(Unit: Million VND)

Proposed Resettlement Site	Land Acquisition And Compensation	Technical Infrastructure	Social Infrastructure	Housing Construction	Others	Total
District 4						116,293
C3 Building, ward 6 District 4	2,700	2,392	1,500	9,377	1,027	16,996
B4 and B5 Buildings, Ward 3, district 4	1,488	2,000	1,000	23,923	2,540	30,951
Phu My residential Place, District 7	10,702	40,057	0	13,272	4,315	68,346
Binh Chanh District						16,398
Binh Hung Commune Residential	3,390	11,971	0	0	1,037	16,398
District 8						187,007
Binh Dang Residential Place, ward 6, district 8	1,190	1,700	0	13,332	558	16,780
Bui Minh Truc Residential Place, ward 5, district 8	4,299	8,115	2,292	54,076	5,745	74,527
Bui Minh Truc Residential Place, ward 6, district 8	692	1,300	369	8,706	925	12,000
Residential Place, Ward 16, District 8	2,807	5,299	1,496	38,446	652	48,700
481 Ben Ba Dinh St., Ward 6, district 8/the storage	5,560	4,925	3,090	19,316	2,109	35,000
Binh Thanh District						11,640
A9 Building, Dinh Bo Linh	1,100	1,120	0	8,920	500	11,640
Total	33,928	78,879	9,747	189,356	19,408	331,338

Cost For Resettlement Sites Development

Type		Cost for resettlement site development (million VND)
Drainage		308,684
	Canal Improvement	289,058
	District 4	116,293
	District 8	172,765
	Drainage pumping station	19,626
	Thanh Da	11,640
	Ben Me Coc 1	3,860
	Ben Me Coc 2	4,126
Sewage		22,654
	IWPS	6,256
	WWTP	16,398
Total		331,338

Disbursement Schedule for Phase I

(million VND)

Year	Compensation Cost	Resettlement site development cost	Total
2000	0	162,138	162,138
2001	299,882	113,928	413,810
2002	251,462	55,272	306,734
Total	551,344	331,338	882,682



Annex 1 Regulation on Compensation and Resettlement in Construction Investment Project Items of Water Environment Improvement Project (Translated from Draft Version)

REGULATION

On Compensation and Resettlement in construction investment project items of Water Environment Improvement Project

I. Compensation for Land

Article 1 Conditions for Land Compensation:

Organizations, households, individuals (hereafter call People), whose land is acquired by the Government, will get compensation if they have one of the conditions regulated in Article 6 of Decree No. 22/1998/ND-CP dated 24 April 1998 of the Government. Details are as follows:

1. Have Certificate on land use right according to the Land Law.
2. Have Decision on land allocation/rent from the authorized Government offices according to the Land Law.
3. Have land transfer paper according to the law.
4. Have the paper on disposal/purchase State-own houses, together with Certificate on land use right according to the Land Law, or Decision on allocation of house together with State-own land by the authorized Government offices.
5. Effective decision from the People's Court on dispute settlement on house attached to land use right or Decision from the authorized Government offices on land dispute settlement.
6. In case, there is no paper mentioned in 1, 2, 3, 4, and 5, land-acquired People must have papers certifying that the acquired land has been used stably before 15 October 1993 and there is no dispute and should belong to one of the following cases:
 - 6.1. Lands used before 08 January 1988, certified by Ward/commune PCs.
 - 6.2. Land allocated by the authorized Government offices during the implementation of land policy of the Government of Democratic Republic of Vietnam, Revolutionary Government of Temporary Public of South Vietnam, the Socialist Republic of Vietnam and the land user had been using that land continuously from that date to the acquired date.
 - 6.3. Have legal papers issued by the authorized offices of the old regime and the land user had been using that land continuously from that date to the acquired date.
 - 6.4. Have papers on land procurement before the date of 18th December 1980 or have land transfer papers from legal land users during the time from 18th December 1980 to 15th October 1993, these papers were certified by the Ward PCs.

- 6.5. Have papers on procurement of house and assets attached to land use right before 15th October 1993, these papers were certified by the Ward PCs.
- 6.6. Have certificate on temporary land use right issued by the HCMC PC or District PCs, Department of Land and Housing (authorized by HCMC PC) or have the name in the list of Land Register Book and still using at the moment.
7. People who were authorized, transferred, inherited, offered, granted land use right or house attached to land use right, and this land belonged to the users who have fully one of the conditions regulated in point 1, 2, 3, 4, 5 and 6 of this Article, but they have not yet fulfilled the procedure of registration transfer.
8. People who self-explore land for agricultural, forestry, aquatic-raising, salt making production before 15th October 1993 and have been using that land continuously until the date of acquisition. There is no dispute, encroachment, and they fulfil all financial duties to the Government.

Article 2 People who will not get land compensation :

1. People whose acquired land have not got one of the conditions as regulated in Article 1 of this Regulation.
2. No land compensation in case of using land violated the planning, width and protection corridor of the infrastructure facilities approved and declared by the authorized Government offices. Only land used before the date of declaration will be considered for compensation.
3. Illegal land encroacher.
4. In some cases, allowance for land damage will be considered according to this Regulation.

Article 3 Land compensation:

1. Land to be compensated:
 - 1.1 Land of households, individuals is the land used for construction of house, facilities for domestic use, i.e. kitchen, yard, well, bathroom, toilet, walkway, animal-breeding sty, store, places for containing animal food, fuel, car park, or land allocated by authorized offices for the purpose of house construction but house is not yet constructed, however, land use right procedure was completed and the site was leveled.
 - 1.2 Condition for land compensation and non-compensation is applied by regulation in Article 1, Article 2 of this Regulation.
 - 1.3 Land area for the compensation calculation is applied by point 2, 3 of this Article.
2. Tariff for compensation calculation:
 - 2.1 Unit price for land compensation calculation is applied by the tariff for urban land regulated in Decision No.05/QD-UB-QLDT dated 04 January 1995 by HCMC PC, to be timed K coefficient, applied according to the tariff in the enclosed annex of this Regulation.

- 2.2 Front land is the land of a house contacted the existing road and is applied by the land tariff regulated in above point 2.1.
- 2.3 Land compensation tariff for non-front land, including land in the lane, is calculated as 50-70% of the front land, depending on the existing condition of respective land area of each District and is defined concretely by the district project Compensation and Resettlement Council.
3. Method of land compensation

Land compensation is applied by either of the following methods:

 - 3.1 Method 1 (compensation by land or other house): Households and individuals, whose total land/house is acquired, will be arranged other land or house in the resettlement site of this project according to the principle: “equivalent value”.
 - 3.1.1 Land or house value for the calculation of exchange is the value of land, house to be compensated and the value level of land, house of the resettlement site plan.
 - 3.1.2 The difference of land/house value between the old and new place is settled by cash based on 2 following cases:
 - 3.1.2.1 In case the value of house/land at the old living place is bigger than the value of the resettled house/land in the new living place, the Investor must pay the land/house users this difference of value.
 - 3.1.2.2 In case the value of house or land at the old living place is smaller than the value of the resettled house or land in the new living place, the land/house users must pay the Investor this difference of value.
 - 3.1.3 Land tariff for compensation, allowance is applied according to point 2 and other conditions regulated in point 3 of this Article.
 - 3.1.4 Land tariff at the resettlement sites is the tariff for the house foundation with completed infrastructures approved by the authorized offices.
 - 3.1.5 For acquired flat, resettlement can be arranged in other buildings with area; ground floor or upper floors... equivalent to the old living place or support in cash for self procurement of new living place.
 - 3.2 Method 2 (Compensation in cash): In case households and individuals whose total land is acquired, and they require to self procurement of new living place, (no requirement of house or land in the project resettlement sites), compensation will made in cash.
 - 3.2.1 The application of compensation tariff, allowance for each household and individual will depend on the origin, legal characteristic and time of land use (the time when the land was changed into living land), as follows:
 - 3.2.1.1 Land with legal papers (according to the Law): compensation of 100% of the land tariff for the area that are being used legally.
 - 3.2.1.2 Land with full papers (according to the regulations) :

- compensation of 99% of the land tariff for the area that are being used according to the regulation.
- 3.2.1.3 For land without or without enough legal papers, but has been used stably, not belonging to disputed and encroached land and was certified by the Ward/ Commune PCs:
- 3.2.1.3.1 Used before 18th December 1980 (the date when Constitution is approved by the National Assembly): compensation of 99% of the land tariff.
- 3.2.1.3.2 Used from 18th December 1980 to before 08th January 1988 (the date when Land Law is declared): compensation of 91% of the land tariff.
- 3.2.2 Land without one of the conditions for compensation due to the lack or not enough legal papers, but not belonging to the disputed or encroached land; not violating planning or protection corridor of technical infrastructures facilities approved and declared by the authorized Government offices, certified by the Ward/Commune PCs:
- 3.2.2.1 Use from 08 January 1988 to 15 October 1993 (the date when 1993 Land Law is effective): Subsidy 91% of the land tariff.
- 3.2.2.2 Use from 15 October 1993 to the date of declaration of planning: subsidy 59% of the land tariff.
- 3.2.2.3 Use from after the date of planning until now: subsidy not more than 40% of the land tariff and not lower than the compensation price for long-term plants growing land regulated in point 4, article 4 of this Regulation.
- 3.3 Land with legal paper
- 3.3.1 Land with legal paper is the land with paper regulated in point 1, 2, 3, 4, and 5 in Article 1 of this Regulation. (completed land use right procedure according to the existing law).
- 3.3.2 Land with legal paper is the land with paper or without paper but there is enough condition for compensation as regulated in point 6 and 7 in Article 1 of this Regulation. (not yet completed land use right procedure or transfer land use right).
- 3.4 Land amount for compensation calculation:
- 3.4.1 In case acquired land owner has no paper defining land amount, calculation is based on the existing situation of usage of respective household (as regulated in part 3.1, point 3.1.1, Article 3 of this Regulation) but not more than 200 m²/household.
- 3.4.2 In case the existing situation of land use is bigger than the area described in legal document but smaller than 200 m²/household, compensation calculation is based on the existing situation of land use. In case the existing situation of land use is bigger than 200 m²/household, compensation calculation is not more than 200 m²/household. The area difference between the existing situation of land use smaller than 200 m²/household, and the level of 200

m²/household with the area described in legal document, will be compensated according to the land use time and tariff regulated in 3.2.1.3 and 3.2.2, part 3.2, Article 3 of this Regulation.

3.4.3 In special case, households, individuals have large land which was used stably and had practice that many generations live in the same house with the construction area of house and subordinate facilities bigger than 200 m²/house, compensation calculation can be higher than the level regulated in point 3.4.1 and will be decided by the project Compensation and Resettlement Council but should not exceed 400 m²/house. For special case, the project Compensation and Resettlement Council will consider and solve respective case concretely.

3.4.4 For the land beyond the level regulated in 3.4.1 and 3.4.3 (if any) belonging to District 4, District 8, Binh Thanh District, and Binh Chanh District (excluding encroached and disputed land), will be compensated not more than 50% of the compensation level of the area within the compensation entitlement. For District 4, District 8, Binh Thanh District and Binh Chanh District, compensation calculation is based on the compensation tariff for garden land with long-term trees as regulated in point 4, Article 4 of this Regulation.

4. In case the rest of land after acquisition is less than 40m²/house, it is settled according to the instruction by HCMC PC in letter No.1405/UB-DT dated 28th April, 2000 on “settlement of flats after clearance with the left-land smaller than the construction standard of HCMC” (less than 40m²/house).
5. Chief Architect Office is responsible for coordination with branches and Chairman of City Appraisal Compensation Council, Chairman of project Compensation and Resettlement Council at districts to agree on the definition of time when planning, width were declared on transportation route and land belonging to the construction area of Water Environment Improvement Project, in order to have the base for the calculation of land compensation for the case of violating planning, width and protection corridor of infrastructures facilities (according to the regulation in point 3.2.2.3 of this Article, point 3 of Article 1 and point 2 of Article 6 of this Regulation) on the spirit of consideration the usage process and limitation damage for the violator.

Article 4 Compensation for Agricultural Land

People who are legally using agricultural land (have one of the conditions regulated in Article 1 of this Regulation) will get compensation in cash as follows:

1. Compensation tariff for annual plant land is applied the maximum tariff (1st level) regulated in Decision No. 05/QD-UB- QLDT dated 04th January 1995 by HCMC PC, which is 19,3000 d/m² to be timed with coefficient K=4.145. Compensation level is 80,000 d/m².
2. For self-dug pond land, compensation is equal to the compensation of annual plant

- land.
3. For the legal individual users' land area along canal, compensation is 50% of the annual plant land regulated in point 1 of this Article.
 4. For garden land which grow long-term trees (with the origin of agricultural land which was invested and improved to become garden), compensation is based on the annual plant land regulated in point 1 of this Article to be added the allowance for the cost of improvement of 30,000 d/m² –50,000 d/m² depending on the existing situation of the land area.
 5. For agricultural land that is located in the existing front roads, compensation is increased not more than 50% of the compensation tariff as regulated and calculated within the area of 100m counting from the road center.
 6. Encroached land is not compensated. For land with State-owned land history, existing users who are temporarily allocated or rented from the State offices in order to cultivate with time limitation and have been using continuously from before 15 October 1993 (but not entitled to get land use right certificate), is compensated not more than 30% of the compensation price for equivalent land type.

Article 5 Land and Assets of State Offices and Other Organizations (Specialized Land)

1. State offices, political organizations, political-social organizations, armed forces, who are granted land without paying land use tax or paid land use tax by Government budget, will not get compensation, but the State will consider to allocate new land and compensate for the cost invested in the land if this cost was not from the Government budget.
2. State-own enterprises, enterprises of political-social organizations, shared companies, companies limited, collective economic units, private enterprises, who are granted land without paying land use tax or paid land use tax by Government budget, will not get compensation, but the State will consider to allocate or rent with the maximum amount not more than acquired land area and compensate for the cost invested in the land if this cost was not from the Government budget.
3. State-own enterprises, enterprises of political-social organizations, shared companies, companies limited, collective economic units, private enterprises, who paid land use tax by non-Government budget, will get land compensation (specialized land), and the State will consider to allocate or rent new land. Allocation, rent of new land regulated in this article should be coincided with the project approved by the authorized office and approved plan.
4. In case workshops, store land has history of self transfer, specialized land or purchased workshops from the State (with land value) by non-Government budget, has legal papers on transfer of house and land use right, will get compensation according to the price level regulated in Article 3 and Article 6 of this Regulation.
5. Offices of administrative, and religious units:
 - For offices of administrative units, schools, health stations, religious units... which have to be relocated partly or acquired partly land and architecture,

- investor and project Compensation and Resettlement Council will prepare plan for creation of fund source for the new construction corresponding with the existing structural construction or will transfer to the other house as instructed by HCMC PC or District PC.
- If offices, and other organizations using house/land with State-owned origin and renting out, they have to stop the renting contract.
6. For land with illegal transfer origin, the project Compensation and Resettlement Council considers and settles with respective case concretely, according to the Letter 1427/CV-DC dated 13th October 1995 of General Department of Land guiding on the settlement of issues relating to land in order to issue land use right according to existing Law.
 7. On the basis of the regulations in point 1, 2, 3, 4, 5, 6 of this Article. District PCs together with the project Compensation and Resettlement Council to organize the investigation of the existing situation and prepare the resettlement, compensation, allowance for concrete cases. If there is any obstacle, it should be suggested to the city Appraisal Compensation and Resettlement Council to appraise for implement or submission to PC HCMC for decision.

II. Compensation, Allowance for Damage of Assets.

Article 6 Compensation for Private-owned House

1. For houses, facilities on the land belonging to the entitled land compensation group as regulated in Article 1 of this Regulation, will get damage compensation:
 - 1.1 House with legal papers: will get compensation 100% of the new tariff on house construction regulated in Decision No.5184/QD-UB-KT dated 09th November 1996 of HCMC PC on the issuance of the standard tariff for house value in order to calculate registration fee, to be timed with the coefficient 1.2.
 - 1.2 House with papers according to the regulation : will get compensation 99% of the house with legal papers.
 - 1.3 House without or lack enough legal papers: will get compensation 90% of the house with legal papers.
 - 1.4 For 4th level-house, temporary house, independent subordinate facilities (without distinguish of with or without legal papers): will get compensation 100% of the house with legal papers.
 - 1.5 House only damaged partly, but cannot be re-used and should be detached totally, compensation will be calculated as for the case of total detachment. House only damaged partly, but can be re-used, compensation for the detached part will be calculated as for the tariff regulated in one of the points 1.1, 1.2, 1.3, and 1.4, plus 10% of the compensated construction part.
 - 1.6 The house part for the calculation of compensation, allowance is the main structure of the house, not including the roof part made of temporary materials.

2. For the house, facilities constructed on the land belonging to the non-compensated targets as regulated in Article 2 of this Regulation, but at the construction time, it did not violate the planning and protection corridor of the technical infrastructures approved and declared by the authorized offices, will get allowance equivalent to 70% of the tariff of legal house. Compensation is not considered in cases that authorized offices issued decision on forced detachment of the violated construction part.
3. Houses illegally constructed on the land with encroached origin will not get compensation, damaged allowance but people have to return to their previous living place or move to the new economic zones. Some cases will get one-time allowances follows:
 - Construction before 15th October, 1993: allowance not more than 5,000,000 d/household.
 - Construction from 15th October, 1993 to the date of declaration of planning area: allowance not more than 2,000,000 d/household.
 - Construction after the date of declaration of planning area until now: no compensation.
4. For house-on-stilt on/along canal, the project Compensation and Resettlement Council prepares the concrete tariff on the basis of the equivalent structural construction as regulated in Decision No.5184/QD-UB-KT dated 09th November 1996 of HCMC PC, to be timed the coefficient 1.2.

Article 7 Compensation for House, Workshop of Enterprises and Other Organizations:

1. For house, workshop, architecture and assets of enterprises and other organizations that can be detached, moved and reinstalled, only compensation for the cost of detachment, transportation and installation and loss during the process of detachment, transportation and installation is calculated based on the actual cost defined by the Compensation and Resettlement Council.
2. For the case of total relocation of workshop and other architectures, compensation is calculated based on the actuarial damage but not lower than 60% of the house value, facilities according to the tariff regulated by 1.1 in Article 6 of this Regulation.
3. The area of house, workshop, architecture for the calculation of compensation is the main architecture of the house, not including the roof part made of temporary materials.

Article 8 For State-owned House:

1. Households and individuals who are legally using houses with State-owned origin (have decision of State offices on house allocation, temporary allocation, house rent) or houses with the State-budget origin, will not get compensation on land and house. Legal users will be continued to rent other house according to the decision of District PC or HCMC PC.



2. If the house users agree to self transfer and will not require to rent State-owned houses, they will get one-time compensation as follows:

2.1 Land and house compensation level:

2.1.1 Street houses and houses in separate piece of land: will be compensated 60% of the tariff regulated in Decision 05/QD-UB dated 04 January 1995 of HCMC PC and additional allowance so that the total compensation will be equal to 60% of the legal land compensation tariff for individual at the similar location (regulated in 3.2 of Article 3 of this Regulation) and 60% of construction tariff for similar structure houses legally owned by individual (regulated in article 6 of this Regulation).

2.1.2 Flat

2.1.2.1 Compensation for land value: compensate according to the compensation level regulated in 2.1.1 (60% of the legal land compensation tariff for individual at the similar location) and allocate depending on the flat story as follows:

Building	Level of compensation and coefficient of floors			
	Ground floor	1st floor	2nd floor	3rd floor upward
2 floors	60% x 0.7	60% x 0.4		
3 floors	60% x 0.7	60% x 0.4	60% x 0.3	
4 floors	60% x 0.7	60% x 0.4	60% x 0.3	60% x 0.2
5 floors upward	60% x 0.7	60% x 0.4	60% x 0.3	60% x 0.2

2.1.2.2 For the house value, it will be compensated 60% of construction tariff as regulated in 2.1.1.

- 2.2 The amount of m² for compensation is the m² described in the temporal allocation decision or house rent contract or allocation decision by State offices (certified by office, management unit of that building). For the case of household living in flat, many households living in the same house, the amount of m² for compensation is equivalent to the floor area used by each household, not including corridor area, balcony, common walkway and encroached area.

- 2.3 If the household self improve, increase the area, new construction which was permitted by the authorized offices, 100% of construction value will be compensated. In case of self improvement, construction without permission before the date of declaration of planning, 80% of construction value will be compensated. In case of self improvement, construction without permission after the date of declaration of planning, there will be no compensation.

3. House with State-owned house history which land/house is acquired partly, but still remained for use, legal user will not get compensation for the acquired part but will get damage allowance according to the tariff for the case of total land/house is



- acquired (regulated in article 2 of this Regulation).
4. Household and individual who are legally using State-owned house, will get land/house allowance as regulated in this article and other allowance as regulated in part III of this Regulation; will be entitled to purchase house/land in new settlement area with the price sold to resettled private-owned house households.
 5. For State-owned house or house by Government budget which are illegally encroached, the project Compensation and Resettlement Council will report to District PC or HCMC PC for decision on acquisition without condition.

Article 9 Compensation for other Assets:

1. House with telephone, water, electric system (registration cost), well, will be compensated:
 - Telephone: according to the new installation fee or transfer fee by City Telephone Company.
 - Main electric meter (registration): according to the new installation fee or transfer fee by City Electric Company.
 - Water meter (registration): 2,000,000 d/pc. In case one part of the house is relocated: 400,000 d – 500,000 d/pc will be compensated.
 - Drilled well:
 - ☐ 1,500,000 d/pc (depth under 30m/pc)
 - ☐ 3,000,000 d/pc (depth from 30m to under 50m/pc)
 - ☐ 5,000,000 d/pc (depth from 50m upward)
 - Well dug manually: 80,000 d/m of depth
2. Other architectural assets:
 - 2.1. Other architecture is compensated according to the tariff regulated in Decision 5184/QD-UB-KT dated 09 November 1996 by HCMC PC to be timed with coefficient 1.2.
 - 2.2. For technical infrastructure (street light, telephone cable, electric line, water supply/drainage pipe...) will be applied concrete relocation method for respective case. Relocation and compensation method will be planned by the direct manager of those facilities according to the technical, economic standard of that branch. This plan will be considered by the authorized offices according to the management procedure for construction investment of the Government: it will be reported to Department of Finance and Pricing for the approval of cost estimation and settlement of account according to existing regulations. In case there is obstacle, it will be submitted to HCMC PC for decision.

Article 10 Compensation for Crops, Trees and Graves:

1. For crops, trees: applied the standard tariff in the annex attached to this Regulation. As for the specialized crops garden, calculation can be increased not more than 50% of the standard tariff.



2. Compensation for the movement of grave:
 - ☐ Soil grave: 1,000,000 d/grave
 - ☐ Normal constructed grave: 1,500,000 d/grave
 - ☐ Semi-solid constructed grave: 2,500,000 d/grave
 - ☐ Solid – constructed grave: 4,000,000 d/grave
 - ☐ Transfer grave: 400,000 d/grave
 - ☐ Support for grave land : 1,000,000 –2,000,000d/grave

III. Other Supports

Article 11 Organizations, households, and individuals who are not belonging to the encroached group, have legal house and have to relocate totally, apart from the damage allowance on land and house, they will get other compensation as follows:

1. Support on life: get one-time allowance of 1,000,000 d for each member in the permanent registration book at the relocated house. For people who have original registration in the City and had long-term registration at the relocated house and who temporally registered at least 5 years, including target group KT3, will get the same allowance level as permanent register.
2. Support for the cost of house detachment and transport
 - 2.1 Individual household: 2,000,000 d/household of 3rd level house upward and 1,000,000 d/household/ of 4th level house, temporary house.
 - 2.2 Office: support based on the amount and actual cost for the transportation and considered concretely by the project Compensation and Resettlement Council.
3. Support for business/production suspension:
 - 3.1 For household heads who directly do the business and have valid permit:
 - Households with income less than 2,000,000 d/month: will get compensation of 1,000,000 d/household.
 - Households with income from 2,000,000 d to less than 4,000,000 d/month: will get compensation of 2,000,000 d/household.
 - Households with income from 4,000,000 d to less than 6,000,000 d/month: will get compensation of 3,000,000 d/household.
 - Households with income from 6,000,000 d to less than 8,000,000 d/month: will get compensation of 5,000,000 d/household.
 - Households with income from 8,000,000 d to less than 10,000,000 d/month: will get compensation of 7,000,000 d/household.
 - Households with income from 10,000,000 d/month upward: will get compensation according to actual interest in 6 months, but not less than 8,000,000 d/household.

Income and actual interest for compensation calculation is the average income and actual interest of the months in most recent year (based on the data from District Tax Division).
 - 3.2 For enterprises that have to be relocated

- 3.2.1 Get 3-months wage allowance according to the suspension allowance for the workers/cadres working at the direct production/business units which have to be relocated. Based on the salary sheet of average salary for previous 6 months. Workers/cadres of administrative units that received salary from Government budget and short-term contractors are not compensated.
- 3.2.2 Allowance of 3 months actual interest (actual interest for compensation calculation is the actual interest of relocated production/business units which was described in the account settlement of average previous 6 months, with approval from authorized offices).
- 3.3 For direct business households (with valid permit) whose part of land is acquired and affected on business, the allowance is not more than 50% of the allowance level regulated in 3.1.
4. For privileged family (with certification from authorized offices), each household will get additional allowance:
 - 4.1 Vietnamese Hero Mother, hero in people's armed force, Labor hero: 5,000,000 d/households
 - 4.2 War invalid, fallen soldiers' family (father, mother, husband, wife, children are fallen soldier): 3,000,000 d/household
 - 4.3 Family with meritorious services to the Revolution and people who are receiving regular social allowance: 1,000,000 d/household.
 - 4.4 If in one household, there are many persons entitled to the privileged policy, only one allowance of the highest privilege is applied.
5. Allowance level for training cost due to the acquisition of agricultural land:
In case one household is acquired from 30% to 50% of legal agricultural land: one allowance is applied. From 50% to 70% of land is acquired: 2 allowances are applied; more than 70%: allowance is applied for the total number of agricultural laborers within the labor age who are registered in the household registration book. Training cost level for 1 allowance is 1,000,000 d.
6. For legal land users (organization, household and individual) who well obeyed the policy on detachment, movement, they will get bonus in cash:
 - 6.1 For the case that total house, land is acquired: not more than 5,000,000 d/household.
 - 6.2 For the case that one part of house, land is acquired: not more than 50% of the bonus level mentioned in point 6.1 above.
 - 6.3 For the case that one part of land is acquired (house is not affected) or more than 50% of the agricultural land is acquired: not more than 1,000,000 d/household.
7. For the case that total house, and land is acquired and users want to find the new living place by themselves, and don't want to go to the project resettlement sites, they will get additional support of 20% of the compensation value, land compensation as the minute of definition of compensation value of that household and the total value of compensation, land compensation is not less than 25,000,000



d/household.

8. Household with special difficulties will get special support according to the decision of the project Compensation Council.

IV. Resettlement (for households that have to relocate total land/house)

Article 12 The project Compensation and Resettlement Council in each district is responsible for coordinating with offices concerned, preparing the concrete plan on construction of new resettlement sites and the plan to resettle people in the relocated area as instructed by HCMC PC. The resettlement is done according to following principles and methods:

1. Apply appropriate method in accordance with the regulation on compensation, damage allowance and concrete situation of household: adjustment, transfer, sale, sale on credit, rent with the appropriate price and suitable to the affordability of each target on the principle of non-profit, and with Government support.
2. Prioritize resettlement foundation or house in the ground floor for household who had legal house in the area which have to be totally relocated.
3. Plan of project resettlement sites: Location, scale, design.. of resettlement sites of Water Environment Improvement Project, will be defined and declared concretely according to the decision of HCMC PC.
4. Relocation is done after the construction of resettlement sites completed. In case, it is necessary to clear the site immediately for the construction, temporary resettlement will be arranged. Expenditures for the temporary resettlement place is paid by the investor. In case, the household arrange the temporary resettlement place by themselves, they will get temporary resettlement allowance of 400,000 - 500,000 d/household/month for the household from 4 members or less and 600,000 - 700,000 d/household/month for the household from 5 members or more depending on the reality of each district. This allowance is applied for the whole duration of awaiting for the new resettlement place, but not more than 1 year.
5. Support policy at resettlement sites: The land or flat price in resettlement sites of this project will not included following costs:
 - Land use cost is not calculated for resettled flat.
 - The Government supports the cost for construction of infrastructures.
 - Resettled people don't have to pay land tax, registration fee, fee for house/land use right certification.
6. Land tariff at resettlement sites
 - 6.1 Compensation method, land/house resettlement is applied according to part 3.1 in Article 3 in this Regulation.
 - 6.2 Project Compensation and Resettlement Council in each district is responsible for declaration publicly on land/house tariff at resettlement sites of the project (after being approved by the authorized offices) so that the affected households can consider and decide the selection of method, location, house type, area, house/land value... at the resettlement sites of the project.

7. Target groups, conditions and types of resettlement:
 - 7.1 Resettlement is applied for legal house/land that is acquired totally and has the requirement for resettlement with the principle of one household/one planned land foundation or one house in the resettlement sites.
 - 7.2 For other cases, Project Compensation and Resettlement Council will consider and deal with respective case concretely on the resettlement requirement.
8. Priority principle in selection of land, house in resettlement sites: In case, many households have the same requirement for selection of the same house location, land in the resettlement sites, the consideration is based on following priority principle:
 - 8.1 Old land belonging to the front road and accepted relocation before the dead line regulated by the Compensation and Resettlement Council.
 - 8.2 Relocated in due time and early register for land foundation.
 - 8.3 If selection according to the above-mentioned criteria cannot be organized, random selection will be applied.
9. Deal with some concrete cases: For resettled households with special difficulties, total land/house compensation is not enough for the payment of land/house in the resettlement sites. These households are certified by Ward PC. They will get special support as follows:
 - 9.1 They are allowed to pay gradually the difference on house/land within the minimum duration of 10 years. Debts are valued into Gold mark 9999 at the debt time and repayment time.
 - 9.2 For special cases, the project Compensation and Resettlement Council will consider and settle concretely on the basis of lengthening the gradual repayment duration or consider to rent the house with the price approved by authorized offices.
10. Procedures for issue of land/house use right: The project Compensation and Resettlement Council and District PCs coordinate with offices concerned of the HCMC and the Investor to instruct the procedures for issue of land/house use right according to existing regulations. Cost for this procedures is paid by the Investor.

VI. Implementation Organization

Article 15 The project Compensation and Resettlement Council in each District is responsible for propaganda, explanation, guidance of the implementation of methods of compensation and resettlement (after being approved by authorized offices) for the affected people so that they can know, implement, supervise, check the compensation, damage allowance and resettlement according to the regulations. If there is any arising problems, it should be reported to the authorized offices for instruction.

Article 16 For the dispute case on land/house use right, compensation is only done after the settlement of the dispute by authorized offices with decision of valid



implementation.

- Arising complaint during the process of compensation, resettlement of the project will be considered and settled by the project Compensation and Resettlement Council according to the procedure of Complaint Law dated 02 December 1998 and according to regulations at Article 37, 38 of Decree No.22/1998/ND-CP dated 24 April 1998 of the Government.

HCMC PC



ATTACHMENT TARIFF FOR COMPENSATION OF TREES, CROPS

(Issued together with Decision on compensation No. /QD-UB-DB dated /2000 of HCMC PC

Types of plants	Unit	Being harvested	Not yet harvested	Small	Newly grown
FRUIT TREES: Cashew, jack-fruit, mango, longan, orange, mandarin, rambutan, sapodilla, grape fruit, milk apple, durian, mangosteen and other plants with equivalent value	d/plant	120,000-150,000	70,000-80,000	20,000-30,000	Method of compensation calculation: cost for seed + labor cost + ...according to existing local price.. For the newly grown trees after the signing of inventory minute is not compensated.
Custard-apple, plum, apple, lemon, apricot, mulberry, dragon fruit, areca-nut, pepper, coffee and other plants with equivalent value	d/plant	80,000-100,000	50,000-60,000	15,000-18,000	
Tamarind, star fruit, sake, decandrous persimmon, betel, cluster fig, cherry, peach, and other plants with equivalent value	d/plant	50,000-70,000	25,000-35,000	10,000-15,000	
Banana, papaya, and other plants with equivalent value	d/plant	15,000-20,000	8,000-12,000	4,000-6,000	
OTHER TREES: - Sindora tree (from P under 20cm/tree) 30,000-100,000 d/plant - Silk-cotton tree: 10,000 -30,000 d/plant - Indigo plant : 8,000-15,000 d/plant - Bamboo: 3,000 - 5,000; - Chinese bamboo: 5,000-7,000 d/plant - Vulgar bamboo: 2,000 - 4,000 d/plant - Bamboo-like phyllostachys: 200 - 500 d/plant - Cajuput, encalyptus : 20,000 - 25,000 d/plant (P over 20cm); 10,000 - 15,000 d/plant (P from 10cm to < 20 cm); 5,000 -10,000 d/plant (P from 5cm to < 10cm); 1,000 - 3,000 d/plant (P from < 5 cm) - Rubber plant: (4 times of the price of encalyptus).					



<p>CROPS</p> <p>Pine apple: 3,000-6,000 d/grove</p> <p>Potato: 800 -1,000 d/grove</p> <p>Ground nut: 800-1000 d/m2</p> <p>Rice: 600-800 d/m2</p> <p>Rice seedling: 5,000 – 7,000 d/m2</p> <p>Water coconut tree: 6,000-8,000 d/grove</p> <p>Sugar cane: 800-1,000 d/m2</p> <p>Vegetable: 3,000-5,000 d/m2</p> <p>Lotus: 8,000-10,000 d/ m2</p> <p>Other crops: 1,000-3,000 d/m2</p> <p>Orchid tree : according to existing local price.</p>	
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Annex 2 The Method For Determination Of K Coefficient In Order To Define The Land Price For Compensation (Part A in Circular No. 145/1998/TT-BTC (Nov. 4, 1998) of Finance Ministry)

I. Scope and Target Group of Application, Bases for Determination of K Coefficient and Land Price for Compensation

1. K Coefficient, scope and target group of application

- 1.1 K Coefficient, stipulated in Article 8 of the Decree No. 22/1998/ND-CP dated April 24, 1998 of the Government, is the rate relation coefficient between the land price that is calculated basing on profitable abilities or the land price that is used for transfer of realistic land use right and the land price that is stipulated by People's Committee of Provinces, Cities under Central Government (hereinafter referred to as Provincial People's Committee)

K Coefficient might be higher than 1 or less than 1, depending on the difference between the land price that is stipulated by provincial People's Committee and the land price that is calculated basing on profitable abilities or the realistic land price that is calculated for the transfer of land use right.

- 1.2 The K Coefficient in this Circular is applied to determine land price for compensation for the persons whose land is acquired in accordance with Article 6 and applied to calculate the money amount that must be handled in State's budget in accordance with Article 14 of the Decree No.22/1998/ND-CP dated April 24, 1998 of the Government on compensation for losses where the Government acquires land for the purposes of national defense, security and national and public interests. In case that the persons whose land acquired is only compensated for investment expenditures on land, realistic expense value is calculated according to the cost of expenditures at the time of land acquisition.
- 1.3 Organization, individual who were allocated or rent land from State is responsible to compensate land losses in accordance with land price as stipulated in this Circular applying for the whole allocated/rented land area.

2. Bases for determination of K Coefficient:

K Coefficient is applied to determine land price for compensation, approved by Chairman of provincial People's Committee for each project in accordance with the proposal of Director of Department of Finance-Pricing and suggestions of related Branches. The bases for determination of K Coefficient are as follows:

- 2.1 The prices for various types of land are decided by provincial People's Committee basing on tariff for various types of land that is promulgated together with the Decree No.



87/CP dated August 17, 1994 of the Government with the guidance in the Inter-ministerial Circular No.94/TT/LB dated November 14, 1994 of Ministry of Finance – Ministry of Construction – General Cadastral Department – National Committee of Pricing, which also covered K Coefficient being stated in Decree No. 17/1998/ND-CP dated March 21, 1998 of the Government and Decision No.302/TTg dated May 13, 1996 of Prime Minister.

- 2.2 Land price is calculated basing on profitable abilities or price for the transfer of realistic land use right in the locality. The price for transfer of realistic land use right is average one for transfer of land use right at each position and at each street with respect to urban land, at each category of each commune with respect to agricultural land and rural residential land at the time to acquire land in the locality.

In case that profitable abilities of land and price for the transfer of land use right are stable (they are fluctuated within a range of under 15%), provincial People's Committee can stipulate K Coefficient to be applied to compensate losses for many projects in that stable duration.

3. Land price for calculation of compensation:

Land price for calculation of compensation is determined on the bases of land price that is promulgated by provincial People's Committee in accordance with Government regulation and is multiplied with K Coefficient.

- For agricultural land, forestry land, salt-pond land, land containing salt-water to be used for breeding aquatic products, K Coefficient is mainly determined basing on rate relation between land price calculated according to profitable abilities and land price stipulated by provincial People's Committee. K Coefficient is only determined basing on rate relation between price for the transfer of realistic land use right and land price stipulated by provincial People's Committee at locals where the transfer of land use right is being popular.
- For other types of land, K Coefficient is determined basing on rate relation between price for the transfer of realistic land use right and land price stipulated by provincial People's Committee.

II. Method for Determination of K Coefficient in order to Evaluate Land Price for Compensation

1. K Coefficient is determined basing on rate relation between land price calculated according to profitable abilities and land price stipulated by provincial People's Committee

Step 1: Determine value of yield, expenditures and income

- To determine value of yield in order to evaluate land price for compensation for agricultural land, forestry land, salt-pond land, land containing salt-water to be used for breeding aquatic products are average ones to be harvested in a year per fixed area unit of each type of land in normal production condition and average cultivation abilities in the locality.
- Logical expenditures are total expenditures of materials and labor by money for each fixed area unit of each land type. It is calculated basing on average expenditure level in the locality at the time of compensation. Department of Finance-Pricing submits logical concrete expenditure of each land type containing respective plant kind and salt-pond land to provincial People's Committee for approval in order to have bases for determination of land price by profitable abilities.
- Income is the balance between average yield value to be gained within the year and logical expenditures on the same fixed area unit of land type.

Prices of agricultural, forestry, and aquatic products, of material expense and labor expense used for determination of yield value, expenditures and income are average values of agricultural, forestry, and aquatic products, material expense, labor expense in the locality market at the time for determination of K Coefficient.

Step 2: Determine land price by profitable abilities

$$(\text{Land price by profitable ability}) = \frac{(\text{Income})}{(\text{Interest rate of credit at State Bank (\% per year) without term})}$$

Step 3: Determine K Coefficient in order to evaluate land price for compensation for losses

$$(\text{K Coefficient}) = A/B$$

A: (Land price by profitable abilities)

B: (Land price promulgated by provincial People's Committee in accordance with the tariff stipulated by the Government)

For example:

At the commune A, it has one hectare of agricultural land (Grade 1). This land is harvested three crops (spring, summer and winter) with the following datum:

- Yield of food, vegetable, bean are exchanged equivalent to 18 tons of rice;
- Price of rice: 2000 VND/1 kg
- Logical expenditures = 60%
- Price of one hectare agricultural land (Grade 1) stipulated by provincial People's Committee is 193,000,000 VND
- Interest rate of credit at State Bank without term = 0.5% per month (6% per year)

To determine K Coefficient in order to evaluate compensation price for one hectare of agricultural land (Grade 1) is as follows:

Step 1: To determine the yield value, logical expenditures and income

- The yield value = 18 tons x 2000 VND/kg = 36,000,000 VND
- Logical expenditures = 18 tons x 60% x 2000 VND/kg
= 21,600,000 VND
- Income = the yield value – logical expenditures
= 36,000,000 – 21,600,000
= 14,400,000 VND

Step 2: To determine land price by profitable abilities:

$$\square (14,400,000 \text{ VND})/6\% = 240,000,000 \text{ VND}$$

Step 3: To determine K Coefficient in order to evaluate compensation price for losses

$$\square \text{K Coefficient} = (240,000,000 \text{ VND})/(193,000,000 \text{ VND}) = 1.2$$

Thus, the K Coefficient of price for agricultural land (Grade 1) is 1.2.

2. **K Coefficient is Determined Basing on Rate Relation between Land Price for the Transfer of Realistic Land Use Right and Land Price Stipulated by Provincial People's Committee.**

Step 1: To collect and analyze information and data

- To collect the price for the transfer of realistic land use right in the locality;
- To formulate synthesized table explaining transport cost of realistic land use right, arranging by time and location.

Step 2: To determine transfer price for realistic land use right of land to be acquired

- For urban land, the comparison should be executed. It is essential to define it belonging to street land, infrastructure conditions, and position, size, area, shape, potential land use and so on.
- For residential land adjacent to urban area, major traffic conjunction and main roads, commercial area, tourism area, industrial area located outside of urban area, we have to compare land types, position, purpose of land use, infrastructure conditions, profitable abilities and so on.

Step 3: To determine K Coefficient in accordance with the following formula:

$$\square (\text{K Coefficient}) = A/B$$



A = (Price for the transfer of realistic land use right in the locality)

B = (Land price promulgated by Provincial People's Committee in accordance with land tariff stipulated by the Government)

K Coefficient, price for the transfer of land use right and land price promulgated by Provincial People's Committee as stated in the above-mentioned formula are applied to each position of respective street by urban land type or by each grade of land with respect to agricultural land, forestry land, salt-pond land and rural residential land.

3. To Determine K Coefficient and Land Price for Compensation for Some Special Cases:

- 3.1 Agricultural land, forestry land, salt-pond land, land containing water surface used for breeding aquatic products located in places that the transfer of land use right have been popularized and the price for the transfer of land use right have been formed already, the K Coefficient can be determined by one of the two above-mentioned methods. However, the land price for compensation is equal to land price for compensation calculated by profitable abilities, plus a maximum additional amount of 60% of the difference between transfer price of land use right and compensation price calculated by profitable abilities of that piece of land.
- 3.2 For land located in newly urbanized areas (as of year 1993, it is still rural areas) or residential land of households having large size, which is included both agricultural land and forestry land, it is compensated basing on the area of residential area which as approved by the authorities to use as residential land. The remaining area is compensated according to the price of agricultural land, forestry land, plus a maximal amount of 30% of the difference part between compensation price for residential land of that household with the compensation price for agricultural land.

Annex 3 Minimum Standard Tariff for house value for the calculation of registration fee in HCMC

HCMC PC

**THE SOCIALIST REPUBLIC OF VIETNAM
INDEPENDENCE - FREEDOM - HAPPINESS**

No. 5184/QĐ-UB-KT

HCMC, 09 November 1996

Decision of HCMC PC on Minimum Standard Tariff for house value for the calculation of registration fee in HCMC

HCMC PC

- Pursuant to the Law on organization of People's Council and People's Committee dated 21 June 1994;
- Pursuant to the Decree No. 193/CP dated 29 December 1994 of the Government on the collection of registration fee and Circular No. 19/TC-TCT dated 16 March 1995 of Ministry of Finance guiding the implementation of Decree No. 193/CP;
- Based on the attached detail classification and tariff for the calculation of house value for the sale of State-owned houses, to be attached to the Decision No. 3365/QĐ-UB-QLĐT dated 03 October 1994 of HCMC PC.
- Considering the suggestion by Tax Department, Department of Construction, City Pricing Division (by official letter No. 4239/CT-Ng.V dated 24 October 1996);

DECIDES

Article 1 – Issue minimum standard tariff for house value in order to have bases for the calculation of registration fee for house, workshop in HCMC PC.

Article 2- Based on the regulation by the Central Government on the house construction price in the city and price variation in the market, Tax Department, Department of Construction, City Pricing Division study and submit to HCMC PC for adjustment and addition to this standard tariff so that it can be suitable to the reality.

Article 3 – This Decision is effective from the date of signing and replaces Decision No. 692/QD-UB-TM dated 04 May 1993 of HCMC PC.

Article 4- Chief Bureau of HCMC PC, Director of Tax Department, Department of Finance and Pricing, Department of Construction, City Pricing Division, Department of Land and Housing, and Chairmen of District PCs are responsible for implementing this decision.

HCMC PC
pp chairman
Vice Chairman
Nguyen Van Chi

**STANDARD TARRIFF FOR HOUSE VALUE
FOR THE CACULATION OF REGISTRATION FEE**

(issued together with the Decision No. 5184/QĐ-UB-KT
dated 09 November 1996 of HCMC PC)

Type of house	Structure	Existing condition	Standard price d/m ² of constructi on floor
(1)	(2)	(3)	(4)
I- Storied villa	1/ Floor, roof: Concrete with steel core; Brick walls	+ newly constructed	2,000,000
		+ old	1,400,000
	2/ Floor: Concrete with steel core; Brick walls; Tile roof with ceiling	+ newly constructed	1,600,000
		+ old	1,120,000
	3/ Floor: constructed by iron I; Brick walls; Tile roof with ceiling	+ newly constructed	1,400,000
		+ old	980,000
	4/ Wooden Floor; Brick walls; Tile roof with ceiling	+ newly constructed	1,300,000
		+ old	910,000
II-Ground villa	1/ Roof: Concrete with steel core; Brick walls	+ newly constructed	1,500,000
	2/ Brick walls; Tile roof with ceiling	+ old	1,050,000
		+ newly constructed	1,200,000
		+ old	840,000

III- Storied street house	1/ Floor, roof: Concrete with steel core; Brick walls	+ newly constructed	1,000,000
		+ old	700,000
	2/ Floor: Concrete with steel core; Brick walls; Tile roof with ceiling	+ newly constructed	900,000
		+ old	630,000
	3/ Floor: constructed by iron I; Brick walls; Tile roof with ceiling	+ newly constructed	800,000
		+ old	560,000
	4/ Wall with brick columns, casting floor, casting roof	+ newly constructed	700,000
		+ old	490,000
	5/ Wall with brick columns, casting floor, casting roof or Tile roof with ceiling	+ newly constructed	600,000
		+ old	420,000
	6/ Casting floor, brick wall, wooden pole, casting roof or Tile roof with ceiling	+ newly constructed	450,000
		+ old	320,000
	7/ Casting floor, wooden + aluminum leaf wall, casting roof or Tile roof with ceiling	+ newly constructed	350,000
		+ old	250,000
	8/ Brick wall, wooden floor, Aluminum leaf or Tile roof with ceiling	+ newly constructed	500,000
		+ old	350,000
	9/ Wooden floor, wooden or aluminum leaf wall, aluminum leaf or Tile roof with ceiling	+ newly constructed	350,000
		+ old	250,000
	10/ Casting underground store	+ newly constructed	1,500,000
		+ old	1,050,000
	11/ Swimming pool on the roof yard, in the yard	+ newly constructed	1,500,000
		+ old	1,050,000

IV- Ground street house	1/ Roof: Concrete with steel core; Brick walls	+ newly constructed	950,000
	2/ Brick wall, aluminum leaf or Tile roof with ceiling; floor with tile or marble, tiled bathroom.	+ old	665,000
	- As above structure, cement floor, carton ceiling, cement-tiled bathroom	+ newly constructed	550,000
		+ old	385,000
		+ newly constructed	400,000
		+ old	280,000
	3/ Brick, aluminum leaf or wooden board wall, aluminum leaf or tile roof, wooden or brick pole.	+ newly constructed	350,000
		+ old	245,000
	4/ Brick, aluminum leaf or wooden board wall, thatch or oil paper roof	+ newly constructed	250,000
		+ old	170,000
	5/ Wooden pole, aluminum leaf roof, cement floor, wooden board ceiling, borrowing wall	+ newly constructed	200,000
		+ old	140,000
	6/ Aluminum leaf or wooden wall, thatch or oil paper roof, wooden frame	+ newly constructed	150,000
		+ old	100,000

V- Workshop	<p>1/ Steel frame</p> <ul style="list-style-type: none"> - Aluminum leaf or fibro roof, brick wall - Aluminum leaf or fibro roof, aluminum or board wall - Aluminum leaf or fibro roof, no wall <p>2/ Wooden frame</p> <ul style="list-style-type: none"> - Aluminum leaf or fibro roof, brick wall - Aluminum leaf or fibro roof, aluminum or board wall - Aluminum leaf or fibro roof, no wall <p>3/ If following details are included</p> <ul style="list-style-type: none"> - Marble floor - Concrete floor - Cement yard - Chinese tile yard - Brick or concrete fence wall - Fence wall: B40 iron net, iron frame - Fence wall: B40 iron net, wooden frame - Fence wall: steel net - Lake 	<ul style="list-style-type: none"> + newly constructed + old + newly constructed + old + newly constructed + old + newly constructed + old + newly constructed + old 	<ul style="list-style-type: none"> 800,000 560,000 500,000 350,000 300,000 200,000 500,000 350,000 350,000 250,000 200,000 150,000 30,000 72,000 30,000 40,000 80,000 60,000 30,000 20,000 150,000
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VI- Some types of additional structure

- Casting half storey + newly constructed : **800,000** d/m²
+ old: 640,000 d/m²
- Preventive Casting half storey + newly constructed : **400,000** d/m²
+ old: 280,000 d/m²
- Wooden board half storey + newly constructed : **300,000** d/m²
+ old: 180,000 d/m²
- Balcony roof with pole or wall + concrete roof or the top yard has roof or decoration :
+ newly constructed : **650,000** d/m²
+ old: 500,000 d/m²
- Preventive casting/aluminum/tile balcony roof, wooden frame, wooden/brick pole,
+ newly constructed : **380,000** d/m²
+ old: 250,000 d/m²
- Balcony roof without pole: no compensation

VII- For the cases which are not regulated in this tariff, the tariff for correspondent house is applied.

This tariff replaces the standard tariff issued together with Decision No. 682/QĐ-UB dated 04 May 1993 of HCMC PC.



Annex 4 Results of Social Survey (conducted 2 November to 16 November 1998)

1. Living Conditions

Total population of the households surveyed is 6,263. Average family size is 5.7 persons, which is much smaller than the data found in the survey by Department of Land & Housing (8.4 persons). The larger families consist of 2 or 3 generations. According to the age structure of all members, under 16 years old (22%) has the largest share, followed by 26-35 years old (21%) and 16-25 years old (20%) as shown in Table 1. Proportion of female (52%) in the all members is larger than that of male (48%) as seen in Table 2.

About 79% of all family members of the respondents are from HCMC. The population from southern and middle areas of Vietnam account for 11% and 4% respectively (See Table 3).

Regarding education level, 32% of all members is primary school, followed by secondary school (30%) and high school (18%) as seen in Table 4. It may be said that education level is higher in resettlement site than on and along canal and in slum areas.

According to the age structure of all members of the surveyed households (1,098 households with 6,263 persons), a group of under 16 years old shows 22%, which is the largest share, and 20.9% of all members is at school. Included the elderly and retired persons (5.7%) and unemployed persons (6.8%), the share of dependent family members becomes high. According to the population by sex, the rate of female is 52% and the number of female head of household is higher than that of male head of household. It may be said that the rate of working women is high to support for the family life.

2. Residential Status and Land Use Right

Table 5 shows that 63% of the total households surveyed has no legal documents of land use and almost half of the households do not hold legal certificates of house ownership. Majority of total households has lived in HCMC for a long time and they have permanent residency as seen in Table 6. If they have legal rights of land use and house ownership, they are charged some taxes and fees such as land use tax and house registration fee that make heavy burden to the households. This may be a major reason for many permanent residents without legal. The share of illegal residents in the surveyed area is rather low with 2%. Since residential status, land use right and house ownership are major factors in calculating compensation of relocation, the combination of these factors makes the compensation various and complicated.

3. Housing Condition

Table 7 shows legal status of house ownership. Nearly half of households on and along



canal and in slum areas do not own legal certificates. Though more than half of households owned certificates before they moved to the resettlement sites, the share of the households that own legal certificates decrease. This reflects that households cannot get certificates until they complete their payment of the cost of new houses.

The length of living in the present place appears in Table 8. Most of the households in resettlement site have lived only less than 5 years. However, about 30% of them had lived in the previous place for 21-30 years before relocation. It means that they left land where they have lived since 1975 for the relocation program. There are still many households living for more than 40 years on and along canals and in slum areas.

Type of house is mostly row house (50%) or ground floor house (38%). Purchase price of house in resettlement sites is shown in Table 9. The price of VND 40-80 million accounts for 46%. Since 56% of the sampled households pay their house cost by 10 year-installments, they should pay back VND 4-8 million on an average per year. This payment shares 22-44% of the annual expenditure of a household, which is a large burden to the most of the households. Also, since the design of new housing is almost standardized and the relocatees who choose to buy the unit offered by the government cannot help living in unstable unit of apartment in spite of their family size, occupation and economic situation, etc.

Domestic facilities owned by the households are mostly TV, radio, bicycle and motorbike as shown in Table 10. The share of electricity meter on and along canals and in slum areas (52%) is much higher than that of water meter (29%). In resettlement sites, most households have electricity and water meters (98% and 87% respectively). Also, the refrigerator in resettlement sites accounts for the higher rate than other sites, which shows high living standard.

Major reasons for living in the present place are close to friends or relatives (33%) and close to work (19%) as shown in Table 11. Problems with living in the present place are shown in Table 12. Flood is the most serious problem considered by the respondents, followed by too many people living around and many garbage.

The ways to get the present houses are mostly self-built (43%) and purchased (34%) as seen in Table 13. Houses are extended even over the canals as the number of family members increases.

4. Income and Income Sources

Household income is regarded as an important indicator for identifying factors involved as well as understanding capacity of household groups when selecting suitable options for resettlement. Based on the household income data provided by respondents, household monthly income can be classified in Table 14. Since the poverty line is identified at VND 250,000 per capita,



- ☐ Poor income households, those with less than VND 2 million monthly income.
- ☐ Medium income households, those with VND 2 million to 3 million monthly income.
- ☐ High income, those with VND 3 million to 5 million monthly income, and
- ☐ Very high income, those with over VND 5 million monthly income.

Distribution of income is highly concentrated to level of VND 1 million - 2 million (39%). Few households under the survey have income more than VND 5 million. Compared with on and along canal and slum areas and resettlement sites, the former two areas show higher share of VND 1-2 million (40%) than the latter (37%). Also, Table 14 indicates that monthly household income of less than VND 2 million on and along canals and in slum areas and in resettlement sites account for 66% and 55% respectively. The figure reveals a high proportion of the poor people who live on and along canals and in the slum area.

Average monthly income of the interviewed families is about VND 2.05 million. Highest income is found on and along canal and in slum areas (VND 100 million) and the lowest one in resettlement sites (VND 140,000).

Among the survey households, a high percentage had an income earning activity in the home, which is mostly informal employment. This reveals that there are many laborers in the canal area engaged in manual worker such as porters, cyclo drivers, garbage collectors, etc. These jobs are often irregular and have low income. Measures for resettling them into high rise apartments, therefore, should be considered in respect to their informal occupation.

Income level differs from different income sources and family structure (how many members are workable). There are many households who operate small restaurant, drug store, repair shop, etc. in their houses, hold street stalls, peddling and trade in the market, and work as irregular labors near their houses. Many of them are informal jobs without official business license. Their incomes will lose or decrease after relocation especially when they live far away from the present places and their housing styles change. For example, living in the upper story unit of apartment, they will lose home base businesses. Table 15 shows that 44% of the respondents decreased their incomes and 45% did not change after relocation.

5. Expenditures of Household

As the highest share of total expenditure, VND 5 to 10 million accounts for 28% on and along canals and in slum areas. However, category of VND 10 to 15 million accounts for 27% in resettlement sites. Annual average expenditure per household is VND 1.7 million as presented in Table 16. Average amount in resettlement site (VND 18.7 million) is the highest. Also, minimum expenditure is the highest in the resettlement sites (VND 1.1 million) which shows the inhabitants spend more money than other sites.



The number of households with loan is not large (28%). Among the households with loan, lenders (45%) or relatives (22%) are common sources.

6. Wastewater/ Solid Waste

52% of the households discharge wastewater and throw solid waste directly to canal/river systems. Toilets are mostly located over the canal. Though houses in the resettlement sites should be equipped with toilets and connected to sewerage system, and garbage collection service is provided, still some households continue their behavior of discharging wastewater and throwing away the garbage into canal, and further many households leave waste in empty yards. While the most inhabitants regard canals/river as important places for wastewater and garbage disposal, this activity is also recognized as a major factor of water pollution.

Main water source in the survey sites is tap water (See Table 17). It is clear that resettlement site shows higher rate of tap water than that of on and along canal and in slum area. 31% of the households on and along canal and in slum areas and 87% of the households in resettlement sites are connected with sewer as seen in Table 18. While more than half of interviewed families on and along canal and in slum area (52%) discharge waste water directly into canal or river system, 12% of households in resettlement site discharge waste water into canal/river. It is noted that about 13% of houses in resettlement site are not equipped with sewer. There are many toilets on canals/river which discharge excreta (Table 19). Households on and along canal that have already agreed with relocation accounts for 26% and households without relocation plan accounts for 44%, which gives heavy burden to canal system.

7. Environmental Problems

Environmental problems that the inhabitants recognized in their surroundings are bad smell, disposal of wastewater and solid waste as seen in Table 20. After resettlement, still solid waste, bad smell and wastewater are their environmental problems. Table 21 indicates that 91% of the respondents think that cleaning of canals is important because they want to be free from obnoxious odor and mosquito/germ. It is noted that the inhabitants can help activities for cleanliness and further they are willing to pay fee for cleaning canals. Also, 66% of the households respond that the best way of water quality improvement is to stop throwing garbage into canals by increasing their own environmental awareness. For this purpose, the inhabitants should change their attitude that canal is important as disposal of wastewater and solid waste.

8. Clean the Environment

Though the topic of cleaning environment has not been discussed so often, this topic is mostly talked during the daily conversation with neighbors (See Table 22). The discussion is usually held in neighborhood units informally. Most of the respondents think the cleanliness



of canal is important and are willing to help these activities (91%). The main reasons are to free from bad odor, and to prevent breeding mosquitoes/germs as shown in Table 21. In order to implement this purpose, 66% of the respondents consider that the best way is to stop throwing garbage into canals and 36% are ready to pay fee (Table 24).

Governmental help (68%), law and fine enforcement (53%) and incentives given to the people are proposed by the respondents as the best way to improve environment generally in HCMC as shown Table 25.

9. Community Participation

(1) Community Activities/Information Sources

Community activities among the respondents are not so active. Among them, however, women's association is the most popular which means that women's role in community is significant. To the question of reasons for living in the present place, "close to friends and relatives" is the largest share, followed by "close to work place", as shown in Table 26. Environmental issues are discussed mostly in the neighborhood unit. So far, community as a whole has no experience of organized activities but small group of community may have some possibility for environmental improvement. The inhabitants usually get information of their society through mass media and PR by the government. Based on this result, in order to diffuse environmental improvement and relocation policy, women's groups and mass media can be used effectively.

Most of the respondents have no experience of vocational training, even the households living in resettlement sites.

(2) Decision Maker

Decision maker in the household is mainly head of household (84% for on and along canals and in slum area). Under the condition that the share of female household is higher than male one, the difference of gender is not remarkable.

(3) Information Sources

The family members of the respondents usually can get information of their surrounding society from TV/radio, newspaper, magazines and PR by governments.

10. Opinions for Relocation/Resettlement

As a relocation package in Table 27, the respondents who have no plan of relocation prefer land with legal title (29%), followed by a package of house to be bought with low interest loan, assistance to get job and land with legal title (26%). Rented house or cash grant only is not preferred. Land with legal title seems to be most important factor for

relocation. If the compensation is not satisfied, 70% of the respondents continue negotiation until final agreement and some of them (12%) will not relocate, which is not neglected. Regarding the respondents' concerns after relocation, Table 28 shows that the respondents want to live in clean environment (66%), to have their own land and build their houses. They expect positive aspects of the relocation more than the negative ones. Basic services to be required by the expected relocatees are water supply, sewerage system, electricity, garbage collection/disposal, transportation, health/education facilities, etc. For more than 70% of the respondents, it took 3-6 months to get new job after relocation and still more 15% needed more than 6 months as indicated in Table 29. During the jobless time, the economic situation of the relocatees is suffered considerably. Households that have already resettled and that have already agreed reply that they understand government relocation policy well and they try to follow the government instruction and comply regulation.

(1) Understanding of Relocation Policy

Toward the question of why they will relocate/relocated, most interviewees who have already agreed with relocation and already resettled in resettlement sites responded that they have to comply with government order as presented in Table 30. The people usually understand the relocation policy provided by the authority (84%).

The respondents without relocation plan consider the relocation package offered by the government as shown in Table 31. They prefer land with legal title, followed by house that they can buy with low interest loan, land with legal title and government assistance to find job.

Half of the respondents who have already agreed had consented relocation at the first negotiation with government. The major reason for disagreement with relocation is unsatisfied compensation. The respondents without relocation plan consider that if compensation is not satisfied they will continue negotiation with government until they come to compromise (Table 32).

(2) Concerns after Relocation

The respondents who have already agreed are concerning with living in clean area and relationship with neighbors after their relocation (Table 33). Loss of the present work is also concerned. The respondents who have no plan of relocation are concerned with living in clean area, own land and house and better school and health facilities. Income decrease is also concerned. Respondents in both sites think much of the living environment.

The services in the new resettlement site that the respondents need are water and electricity meters, sewer and garbage collection (Table 34). The households who have already agreed concern with training of human resources and income generation program as the fourth priority.

(3) Affect from Relocation/Resettlement

Most of the respondents consider that they will lose a whole land they live in by the requisition of land by the authority for the construction of environmental facilities. The respondents who have no plan of relocation are afraid of relocation of house and land and income decrease after relocation as seen in Table 35. As options of resettlement, the respondents without relocation plan prefer to move to on-site resettlement site provided by the government, followed by the preference of living in the resettlement site provided inside the district (Table 36). However, the respondents who have already agreed prefer to live in the resettlement site in other districts.

Regarding the capacity of household who want to buy a unit of apartment in the new resettlement site, the respondents can pay at installment systems (Table 37). Among the respondents who cannot afford to pay all in cash, they mostly prefer the installment time is 10 years (57%).

Table 29 presents the duration to be taken to find jobs after relocation. 71% of the households already settled in resettlement sites took 3-6 months until they got new jobs.

Additionally, 14% of the respondents needed more than 6 months. It means that these households have experience of the decrease of income during this time after relocation. Table 38 also supports this. Income decreased for 44% of the households and no change for 45%.

Table 39 and Table 40 show advantages and disadvantages of relocation respectively. As advantages of relocation, close to school (70%) and to get better house (56%) and electricity meter (34%) are listed. On the contrary, disadvantages of relocation are poor water supply (33%) and poor health facilities (18%).

Table 1 Age of All Members of Sampled Households

Site	Category	Unit	<16 years	16-25 years	26-35 years	36-45 years	46-55 years	56-60 years	60< years	Un- known	Total
On and Along Canal	Already agreed	Persons	65	58	54	55	19	8	20	0	281
		%	23.2	20.6	19.2	19.6	6.8	2.8	7.1	0	100
On and Along Canal/Slum Area	No plan	Persons	1,110	1,011	1,030	785	398	114	391	76	4,915
		%	22.6	20.6	20.9	16.0	8.1	2.3	7.9	1.6	100
Resettlement	Already Resettled	Persons	209	187	220	148	63	34	87	119	1,067
		%	19.5	17.5	20.6	13.9	5.9	3.2	8.2	11.2	100
Total		Persons	1,384	1,256	1,304	988	480	156	498	195	6,263
		%	22.1	20.1	20.8	15.8	7.7	2.5	7.9	3.1	100

Table 2 Sex of All Member of Sampled Respondents

Site	Category	Unit	Male	Female	Total
On and Along canal	Already agreed	persons	137	144	281
		%	48.8	51.2	100
On and Along Canal/Slum Area	No plan	persons	2,388	2,527	4,915
		%	48.6	51.4	100
Resettlement Site	Already resettled	persons	457	610	1,067
		%	42.8	57.2	100
Total		persons	2,982	3,281	6,263
		%	47.6	52.4	100

Table 3 Birth Place of all Members of Sampled Households

Site	Category	Unit	HCMC	North	Middle	West	South	Others	Unknown	Total
On and Along Canal	Already agreed	persons	230	18	14	15	3	1	0	281
		%	81.9	6.4	4.9	5.3	1.1	0.4	0	100
On and Along Canal/Slum Area	No plan	persons	3,960	89	146	0	592	42	86	4,915
		%	80.6	1.8	2.9	0	12	0.9	1.8	100
Resettlement site	Already resettled	persons	771	69	118	0	91	4	14	1,067
		%	72.3	6.5	11.1	0	8.4	0.4	1.3	100
Total		persons	4,961	176	278	15	686	47	100	6,263
		%	79.2	2.8	4.4	0.2	10.9	0.8	1.6	100

Table 4 Education of All Members of Sampled Households

Site	Category	Unit	No School	Primary School	Secondary School	High School	Vocational School	College/ University	Others	Un known	Under 6 years old	Total
On and Along Canal	Already agreed	persons	25	40	71	59	3	22	0	42	19	281
		%	8.9	14.2	25.3	21	1.1	7.8	0	14.9	6.8	100
On and Along Canal/Slum Area	No plan	persons	439	1,793	1,473	803	10	135	62	145	55	4,915
		%	8.9	36.5	29.9	16.3	0.2	2.8	1.3	2.9	1.1	100
Resettlement Site	Already resettled	persons	46	163	349	278	3	75	12	55	86	1,067
		%	4.3	15.3	32.7	26.1	0.3	7	1.1	5.2	8	100
Total	Total	persons	510	1,996	1,893	1,140	16	232	74	242	160	6,263
		%	8.1	31.9	30.2	18.2	0.3	3.7	1.2	3.9	2.6	100

Table 5 Legal Status of Land Use and Houses

	Unit	Legal Status of Land Use				Legal Status of House Ownership				
		Own Legal Document	No Legal Document	Unknown	Total	Own Official Certificate	Certificate Not Approved	No Certificate	Unknown	Total
On and Along Canal	households	231	634	35	900	261	122	480	37	900
	%	25.7	70.4	3.9	100	29	13.6	53.3	4.1	100
Resettlement Site	households	134	57	7	198	68	52	68	10	198
	%	67.7	28.8	3.5	100	34.3	26.3	34.3	5.1	100
Total	households	365	691	42	1,098	329	174	548	47	1,098
	%	33.3	62.9	3.8	100	30	15.8	49.9	4.3	100

Table 6 Residential Status of All Members of Households

Site	Unit	Permanent	Temporary	Illegal	Others	Unknown	Total
On and Along Canal	households	4,180	840	118	2	56	5,196
	%	80.4	16.1	2.3	0.1	1.1	100
Resettlement Site	households	806	219	8	0	34	1,067
	%	75.5	20.5	0.8	0	3.2	100
Total	households	4,986	1,059	126	2	90	6,263
	%	79.6	16.9	2	0.1	1.4	100

Table 7 Legal Status of House

Site	Category	Unit	Own Official Certificate	Certificate Not Approved	No Certificate	Un-Known	Total
On and Along Canal	Already	households	17	4	19	2	42
	Agreed	%	40.5	9.5	45.2	4.8	100
On and Along Canal/Slum Area	No plan	households	244	118	461	35	858
		%	28.4	13.8	53.7	4.1	100
Resettlement Site	Before Relocation	households	104	62	25	7	198
		%	52.6	31.3	12.6	3.5	100
	After Relocation	households	68	52	68	10	198
		%	34.3	26.3	34.3	5.1	100

Table 8 Years of Living in the Present Place

Site	Category	Unit	<5 years	6-10	11-20	21-30	31-40	40<	Unknown	Total
On and Along Canal	Already	Households	2	9	8	12	5	2	4	42
	Agreed	%	4.8	21.4	19.1	28.6	11.9	4.8	9.5	100
On and Along Canal/Slum Area	No plan	Households	83	147	172	133	150	173	0	858
		%	9.7	17.1	20.1	15.5	17.5	20.2	0	100
Resettlement Site	Before Relocation	Households	15	18	37	59	44	21	4	198
		%	7.6	9.1	18.7	29.8	22.2	10.6	2.0	100
	After Relocation	Households	190 (53)	2	0	1	0	0	5	198
		%	96.0(26.8)	1.0	0	0.5	0	0	2.5	100

Note: Numbers in parentheses show less than 2 years.

Table 9 Purchase Price of Houses in Resettlement Sites

(unit: VND million)

Unit	<40	40-80	81-120	121-160	161-200	201-240	240-280	280<	Unknown	Total
Households	10	90	46	23	4	4	1	4	16	198
%	5.1	45.5	23.2	11.6	2.0	2.0	0.5	2.0	8.1	100

Table 10 Domestic Facilities Owned by Sampled Households

Site	Category	Unit	Electricity Meter	Water Meter	Well	Telephone	TV	Radio	Bicycle	Motorbike	Washing Machine	Refrigerator	Un-known
On and Along Canal	Already agreed	household	17	12	9	11	33	17	31	28	6	11	3
		%	40.5	28.6	21.4	26.2	78.6	40.5	73.8	66.7	14.3	26.2	7.1
On and Along Canal/Slum Area	No plan	household	450	247	90	97	590	445	665	444	1	0	48
		%	52.4	28.8	10.5	11.3	68.8	51.9	77.5	51.7	0.1	0	5.6
Total of (1) and (2)		household	467	259	99	108	623	462	696	472	7	11	51
		%	51.9	28.8	11	12	69.2	51.3	77.3	52.4	0.8	1.2	5.7
Resettlement Site	Already resettled	household	194	172	4	44	181	135	134	129	31	90	4
		%	97.8	86.9	2	22.2	91.4	68.2	67.7	65.2	15.7	45.5	2

Table 11 Reasons for Living in the Present Place

Site	Category	Unit	Close to Work	Close to Friends/Relatives	Living for Long Time	Assets are Left	Housing is Cheap	Others	Un-known	Total
On and Along Canal	Already agreed	households	1	4	11	6	7	13	0	42
		%	2.4	9.5	26.2	14.3	16.7	30.9	0	100
On and Along Canal/Slum Area	No plan	households	222	382	85	96	124	201	31	1,141
		%	19.5	33.5	7.4	8.4	10.9	17.6	3.6	100
Total		households	223	386	96	102	131	214	31	1,183
		%	18.9	32.6	8.1	8.6	11.1	18.1	2.6	100

Table 12 Problems with Living in the Present Place

Site	Category	Unit	Flood	Garbage Disposal	Too Many People	Suffer from Diseases	No Legal Title to Land/House	Hard to Get Job	Lack of Schools/Health Facilities	Others	No problems	Unknown
On and Along Canal	Already agreed	households	37	4	10	3	1	0	0	2	0	0
		%	88.1	9.5	23.8	7.1	2.4	0	0	4.8	0	0
On and Along Canal/Slum Area	No plan	households	486	269	319	78	104	98	14	40	51	56
		%	56.6	31.4	37.2	9.1	12.1	11.4	1.6	4.7	5.9	6.5
Total		households	523	273	329	81	105	98	14	42	51	56
		%	34.5	18	21.7	5.3	6.9	6.5	0.9	2.8	3.4	3.7

Table 13 Way to Get House

Site	Category	Unit	Self-built	Inherited	Purchased	Rented	Alloted	Others	Un-known	Total
On and Along Canal	Already agreed	Households	12	6	21	0	0	1	2	42
		%	28.6	14.3	50	0	0	2.4	4.7	100
On and Along Canal/Slum Area	No plan	Households	387	114	278	2	4	9	25	858
		%	45.1	13.3	32.4	1	2	1.1	2.9	100
Resettlement Site	Before relocation	Households	73	39	74	9	36	3	3	198
		%	36.9	19.7	37.4	1.1	4.2	1.5	1.5	100
Total		Households	472	159	373	11	40	13	30	1,098
		%	43	14.5	34	1	3.6	1.2	2.7	100

Table 14 Monthly Income per Household

Site	Category	Unit	< 1	1 <=	2 <=	3 <=	4 <=	5 <=	6 <=	Un- known	Total	Average (VND 1,000)	Mini./ Max.
On and Along Canal(1)	Already agreed	Households	3	17	10	5	2	1	2	2	42	2,310.75	200,000.00
		%	7.1	40.5	23.8	11.9	4.7	2.3	4.7	2.3	100		8,000,000
On and Along Canal(2)	No plan	Households	230	343	120	51	29	11	25	49	858	1,867.62	24,000.00
		%	26.8	40	14	5.9	3.4	1.3	2.9	5.7	100		100,000,000
Total of (1)and (2)		Households	233	360	130	56	31	12	27	51	900		
		%	25.9	40	14.4	6.2	3.4	1.3	3	5.7	100		
Resettlement Site	Already resettled	Households	35	73	45	14	7	0	7	17	198	1,968.49	140,000.00
		%	17.7	36.9	22.7	7.1	3.5	0	3.5	8.6	100		10,000,000
Total		Households	268	433	175	70	38	12	34	68	1,098	2,048.95	
		%	24.4	39.4	15.9	6.4	3.5	1.1	3.1	6.2	100		

Table 15 Income Change After Relocation

Unit	Increase	Decrease	No Charge	Unknown	Total
households	7	87	89	15	198
%	3.5	43.9	44.9	7.6	100

Table 16 Annual Expenditure per Household

Site	Category	Unit	<=1	1< <=5	5< <=10	10< <=15	15< <=20	20< <=30	30< <=40	40< <=50	50<	Unknown	Total	Average (1,000 VND)	Min./ Max.
On and Along Canal (1)	Already agreed	households	1	1	8	12	9	7	1	0	1	2	42	16,455.50	960,000
		%	4	4	19	28.6	21.4	16.7	2.4	0	2.4	4.8	100		68,870,000
On and Along Canal/Slum Area (2)	No plan	households	2	80	248	216	112	124	27	8	4	37	858	16,102.20	150,000
		%	0.2	9.3	28.9	25.2	13.1	14.5	3.1	0.9	0.5	4.3	100		200,250,000
Total of (1) and (2)		households	3	81	256	238	121	131	28	8	5	39	900		
		%	0.3	9	28.4	26.4	13.4	14.6	3.1	0.9	0.6	4.3	100		
Resettlement Site	Already resettled	households	0	9	19	54	50	41	11	8	0	6	198	18,684.80	1,100,000
		%	0	4.5	9.6	27.3	25.3	20.7	5.6	4	0	3	100		126,200,000
Total		households	3	90	275	282	171	172	39	16	5	45	1,098	17,080.80	
		%	0.3	8.2	25	25.8	15.6	15.8	3.6	1.5	0.5	4.1	100		

Table 17 Main Water Source

Site	Category	Unit	Tap water	Well	Rain Water	River	Buying	Use from Neighbor	Others	Un- known
On and Along Canal(1)	Already agreed	households	5	24	1	0	0	2	1	9
		%	11.9	57.1	2.4	0	0	4.8	2.4	21.4
On and Along Canal/Slum Area	No plan	households	625	113	43	1	63	0	22	38
		%	72.8	13.2	5	0.1	7.3	0	2.6	4.4
Total of (1)and(2)		households	630	137	44	1	63	2	23	47
		%	69.6	15.1	4.9	0.1	7	0.2	2.5	5.2
Resettlement	Already resettled	households	153	37	0	3	24	0	0	5
		%	77.3	18.7	0	1.5	12.1	0	0	2.5
Total		households	78.3	174	44	4	87	2	23	52
		%	71.3	15.8	4	0.4	7.9	0.2	2.1	4.7

Table 18 Place for Waste Water Discharge

Site	Unit	Sewer	Pool/ Lake	Canal	River	Empty land	Un- known
On and Along Canal/Slum Area	households	280	58	158	309	4	91
	%	31.1	6.4	17.6	34.3	0.5	10.1
Resettlement	households	172	1	7	17	0	1
	%	86.9	0.5	3.5	8.6	0	0.5
Total	households	452	59	165	326	4	92
	%	4.1	5.4	15	29.7	0.4	8.4

Table 19 Type of Toilets

Site	Category	Unit	Private with Septic Tank	Private without Septic Tank	Public Toilet	Toilet on Pool/Lake	Toilet on Canal/River	Leaching Pit	Empty land	Unknown
On and Along Canal	Already agreed	households	24	4	0	1	11	0	0	2
		%	57.1	9.5	0	2.4	26.2	0	0	4.8
On and Along Canal/Slum Area	No plan	households	243	123	61	13	377	4	4	37
		%	28.3	14.3	7.1	1.5	43.9	0.5	0.5	4.3
Total		households	267	127	61	14	388	4	4	39
		%	29.7	14.1	6.8	1.6	43.1	0.4	0.4	4.3

Table 20 Environmental Problems Around Houses

Site	Unit	Waste Water	Solid Waste	Bad Smell	Others	No Problems	No Answer	Total
On and Along Canal	households % of total responses	498	399	586	17	156	38	1694
		55.3	44.3	65.1	1.9	17.3	4.2	100
Resettlement Site	households % of total responses	39	52	103	23	69	8	294
		19.7	26.3	52	11.6	34.8	0.4	100

Table 21 Reasons and Ways to Clean Canals

Unit	Reasons for Cleaning Canals						Ways to Clean Canals					
	Free from obnoxious Odor	No mosquito and germ	Raise value of housing lot	Safe shipping	Others	Unknown	Pay fee for cleaning to gov.	Stop throwing garbage	Widen Canal	Dredg Canal	Others	Unknown
households % of total responses	804	791	559	610	29	40	321	592	3	3	40	56
	89.3	87.9	62.1	67.8	3.2	4.4	35.7	65.8	7.1	7.1	4.7	6.2

Table 22 Place of Discussion on Environment Improvement

Site	Category	unit	General community meeting	Neighborhood unit	Temple/ Church	School	Work Place	Others	Unknown
On and Along Canal(1)	Already agreed	households %	0	37	0	1	3	1	2
On and Along Canal/Slum Area(2)	No plan	households %	0	88.1	0	2.4	7.1	2.4	4.8
			57	744	8	7	1	11	46
			6.6	86.7	0.9	0.8	0.1	1.3	5.4
Total of (1) and (2)		households %	57	781	8	8	4	12	48
Resettlement Site	Already resettled	households %	6.6	86.8	0.9	0.9	0.4	1.3	5.3
			11	161	1	1	0	13	15
			5.6	81.3	0.5	0.5	0	6.6	7.6

Table 23 Relocation Package preferred by Households without plan of Relocation

Unit	Land with Legal title	House to be Bought with low interest loan & Legal land	House to be Bought with low interest loan & Legal land & help To find	House to be Bought with low Interest loan & Legal land & help To find job & to relocated	House for Rent	Cash grant	Others	Unknown
Households	247	153	220	138	8	81	13	70
%	28.8	17.8	25.6	16.1	0.9	9.4	1.5	8.2

Table 24 How to Improve Canal Cleanliness

Site	Category	Unit	Pay fee for cleaning to Government	Stop throwing garbage	Widen Canal	Dredging Canal	Others	Unknown
On and Along Canal	Already agreed	Households %	23 54.8	12 28.6	3 7.1	3 7.1	0 0	2 4.8
On and Along Canal/Slum Area	No plan	Households %	298 34.7	580 67.6	0 0	0 0	40 4.7	54 6.3
Total		Households %	321 35.7	592 65.8	3 7.1	3 7.1	40 4.7	56 6.2

Table 25 Best Way for Environmental Improvement

Site	Category	Unit	Give Incentives	Give gov. help	Competition for cleanliness	Enforcing law/fine	Others	Un-known
On and Along Canal (1)	Already agreed	households %	2 4.8	29 69.0	1 2.4	2 4.8	4 9.5	5 11.9
On and Along Canal/Slum Area (2)	No plan	households %	361 42.1	584 68.1	94 10.9	189 22.0	31 3.6	40 4.7
Total of (1) and (2)	Already resettled	households %	363 40.3	613 68.1	95 10.6	191 21.2	35 3.9	45 5.0
Resettlement Site		households %	25 12.6	97 48.9	43 21.7	104 52.5	16 8.1	9 4.5

Table 26 Responses for Living in the Present Place On and Along Canals

Unit	Close to work	Close to Friends/ Relatives	Living for Long Time	Assets are Left	Housing is Cheap	Others	Unknown	Total
households	223	386	96	102	131	214	31	1,183
%	18.9	32.6	8.1	8.6	11.1	18.1	2.6	100

Table 27 Relocation Package Preferred by Households without Relocation Plan

Unit	Land with legal title	House to be bought with low interest loan & legal land use	House to be bought with low interest loan & legal land use& help to find job	House to be bought with low interest loan & legal land use& help to find job & to relocate	House for rent	Cash grant	Others	Unknown	Total
households	247	153	220	138	8	81	13	70	930
% of total responses	28.8	17.8	25.6	16.1	0.9	9.4	1.5	8.2	100

Table 28 Concerns After Relocation

Unit	Own land/build own house	Live in clean area	More chance to get work	Better school/health facilities	Decrease income	Lose present job	Spend more money	Relocation with neighbors	Others	Unknown	Total
households	486	590	98	379	285	132	19	22	1	53	2,065
% of total responses	54	65.6	10.9	42.1	31.7	14.7	2.1	2.4	0.1	5.9	100

Table 29 Length to Find Jobs After Relocation

(Unit-months)				
Unit	<=3	3-6	6-12	12<=
households	16	141	28	1
%	8.1	71.2	14.1	0.5
				Total
				198
				100

Table 30 Reasons to Move to Live in the Present Place

Site	Category	Unit	Comply with gov. order	Improve environment in the city	Have a better & clean living condition	Others	Un-known
On and Along Canal	Already agreed	Households	32	1	6	1	3
		%	76.2	2.4	14.3	2.4	7.1
Resettlement Site	Already resettled	Households	175	16	28	3	8
		%	88.4	8.1	14.1	1.5	4.0

Table 31 Reasons for Cleaning Canals

Site	Category	Unit	Free from Obnoxious Odor	No mosquitoes/ germs	Raise value of housing lot	Safe shipping	Others	Un-known
On and Along Canal	Already Agreed	households	39	38	38	1	1	2
		%	92.9	90.5	90.5	2.4	2.4	4.8
On and Along Canal/Slum Area	No plan	households	765	753	521	609	28	38
		%	89.2	87.8	60.7	70.9	3.3	4.4
Total		Households	804	791	559	610	29	40
		%	89.3	87.9	62.1	67.8	3.2	4.4

Table 32 In case of Unsatisfied Compensation for Households Without Plan of Relocation

Unit	Negotiation with Gov.	Receive Compensation	Not relocate	Others	Unknown
Households	602	67	101	25	63
%	70.2	7.8	11.8	2.9	7.3

Table 33 Concerns After Relocation

Site	Category	Unit	Own land/ build own house	Live on clean area	More chance to get work	Better school/health facilities	Decrease of income	Lose present work	Spend more money	Relation with neighbors	Others	Unknown
On and Along Canal	Already agreed	households	9	25	0	4	4	15	6	22	1	2
		%	21.4	59.5	0	9.5	9.5	35.7	14.3	52.4	2.4	4.8
On and Along Canal/Slum Area	No plan	households	477	565	98	375	281	117	13	0	0	51
		%	55.6	65.9	11.4	43.7	32.8	13.6	1.5	0	0	5.9
Total		households	486	590	98	379	285	132	19	22	1	53
		%	54	65.6	10.9	42.1	31.7	14.7	2.1	2.4	0.1	5.9

Table 34 Basic Services Preferred by Households Who Have Not Yet Relocated

Site	Category	Unit	Water meter	Electricity meter	Sewerare system	Garbage dosposal/ collection	Roads/ transportation facilities	Training for income generation	Health nutrition services	Family planning program	Others	Unknown
On and Along Canal	Already agreed	households	36	36	5	2	3	10	6	1	0	2
		%	85.7	85.7	11.9	4.8	7.1	23.8	14.3	2.4	0	4.8
On and Along Canal/Slum Area	No plan	households	781	774	640	567	427	330	383	45	4	58
		%	91	90.2	74.6	66.1	49.8	38.5	44.6	5.2	0.5	6.8
Total		households	817	810	645	569	430	340	389	46	4	60
		%	90.8	90	71.7	63.2	47.8	37.8	43.2	5.0	0.4	6.7

**Table 35 Life/Income to be Affected by Env. Facility Construction
in the Area without Plan of Relocation**

Unit	Relocation	Decrease of Income	Dis- continue of schooling	Difficulties with neighborhood	Unfair compensation	Insufficient compensation for new life	Others	Un- known
households	380	366	121	82	92	128	184	42
%	44.3	42.7	14.1	9.6	10.7	14.9	21.4	4.9

Table 36 Resettlement Options

Site	Category	Unit	Self-finding in the same district	Self-finding outside the district	On-site resettle- ment by gov.	Inside district resettle- ment by gov.	Other District Resettle Ment	Others	Un- known
On and Along Canal	Already agreed	Households	3	1	3	3	23	7	2
		%	7.1	2.4	7.1	7.1	54.8	16.7	4.8
On and Along Canal/Slum Area	No plan	Households	200	87	389	339	119	35	56
		%	23.3	10.1	45.3	39.5	13.9	4.1	6.5
Total		Households	103	88	392	342	142	42	58
		%	11.9	9.8	43.6	38.0	15.8	4.7	6.4

Table 37 Capacity for Buying New House

Site	Category	Unit	Cash	Installment	Rent	Build	Others	Unknown
On and Along Canal	Already agreed	households	1	27	1	2	2	10
		%	2.4	64.3	2.4	4.8	4.8	23.8
On and Along Canal/Slum Area	No plan	households	139	563	12	87	0	57
		%	16.3	65.6	1.4	10.1	0	6.6
Total		households	140	590	13	89	2	67
		%	15.6	65.6	1.4	9.9	0.2	7.4

Table 38 Income Change After Relocation

Unit	Increase	Decrease	No change	Unknown	Total
Households	7	87	89	15	198
%	3.5	43.9	44.9	7.6	100

Table 39 Advantages of Relocation

Unit	Close to Friends/ Relatives	Close to work	Close to School	Better house than before	Electricity meter	Good water supply	Can spend more money	Others	Un-known
households	15	30	139	110	68	19	11	2	10
%	7.6	15.2	70.2	55.6	34.3	9.6	5.6	1.0	5.1

Table 40 Disadvantages of Relocation

Unit	Difficult to Transfer School	Poor health facilities	Poor electricity supply	Poor water supply	Difficult to find jobs	Isolated from friends/ relatives	Additional expenditure	Others	Un-known
Households	31	35	8	66	33	27	1	44	43
%	15.7	17.7	4	33.3	16.7	13.6	22.2	21.7	0.5