

第5章 環境予備調査

5-1 環境配慮実施の背景

ここでは、現地踏査(表5-1)、UPI等からの聞き取り、収集資料等から環境の現状を述べる。

(1) 水質汚濁

現地踏査の結果から、生活排水は未処理のまま排水されているため、市中心部の河川や運河には真っ黒な水が滞留し、悪臭を放ち、メタンガスが発生、ゴミの浮遊や堆積がみられた。市北部の運河では、工場廃水が未処理で排水され、水銀や亜鉛で汚染されている、とのことである。市東部(Linh Trung 地区)の工業団地予定地では、河川は工場廃水で汚染されており、河川の上流32工場のうち、10工場が廃水処理されているだけとのこと。水利用上では、市中心部の河川での、水生野菜の栽培、水浴が問題である。運河を通行する多くの運搬船からの廃油やゴミの投棄も問題である。感潮河川のため、乾期などの少流量時には、下流にほとんど汚水が流下しないのが特徴である。ティゲ川では、たまたま大潮時に現地踏査実施、流速1 m/s以上で、浮遊ゴミとともに汚水が遡上していた。

環境技術センター (CEFINEA-Center for Environmental Technology) は、ホーチミン市の環境モニタリングセンターとして機能し、サイゴン川、ドンナイ川のモニタリングステーションを有する。これらのデータは、EIAに活用されている。ラボを有し、器材は供与されたもので、技術面、設備面とも問題はないと思われる。サイゴン川に設けられたモニタリングステーションで、月に2回(1回当たり干潮時と満潮時のサンプルを収集)水質測定を行っている。分析項目は化学、物理、重金属、DDTなどの農薬項目である。ただし、経済的理由で底質測定は行っていない。ニューロック、ティゲの水質は、当センターで調査したので、データを多く所有している。

表5-1 現地踏査による環境状況

年月日	場所	環境状況
1998年1月11日午後、 13日午後及び14日 午前	ティゲ川	<ul style="list-style-type: none"> ・移転者用住宅あり。 ・ティゲ川下流部で泳ぐ子供。上げ潮時のため、サイゴン川水が遡上し、それほど汚れていない。 ・ティゲ川へ続く水路には、不法居住者の家屋あり。 ・ティゲ川河口。水面の変色域が見える。下げ潮時。12時ごろ干潮。 ・空心菜の栽培。真っ黒な水、悪臭。水利用上問題である。 ・ティゲ橋付近。不法占拠住宅は、移転した。 ・撤去後の工事。 ・撤去進行中。杭がまだ残っている。 ・建設された移転住宅。 ・浮遊ゴミが多い。 ・空心菜の栽培。上流まで至る所で栽培されている。ロープに通した発泡スチロールを浮かべて、浮遊ゴミが侵入しないよう工夫されている。 ・採水を行った。流速は下げ潮のためかわりと速い。約1m/s程度。このあたりからメタンガスの発生がみられる。 ・ティゲ川上流端。その後、暗渠となる。第1級配管システムとなっている。
1998年1月11日午後 及び13日午前	ローゴム水路	<ul style="list-style-type: none"> ・真っ黒な水。辺り一面腐卵臭。メタンガスの発生。 ・有価物（主に木片）を捨てる小舟。 ・水路の陸上部には、多くの民家の庭先に線香が干してあった。 ・土砂運搬船が多数。 ・不法居住者が多数。
1998年1月13日午前	調査区域北側と西側の水路 (Kinh Cau An Ha)	<ul style="list-style-type: none"> ・多くの製糖工場が水路沿いに分布。甘い香り漂う。砂糖キビを運搬する船が多い。 ・このあたり悪臭はない。
1998年1月13日午後	調査区域北縁と空港との間の水路 (Rach Ben Cai)	<ul style="list-style-type: none"> ・水路の北側に国道1号線があり、国道沿いに工場が分布。工場廃水のため、水銀、亜鉛の有毒物質で汚染されているとのこと。
1998年1月14日午後	市内予定地	<ul style="list-style-type: none"> ・工業団地予定地、河川は工場廃水で汚染されている。上流32工場のうち、10工場が廃水処理されているだけ。ここは残りの工場廃水のための処理場予定地でもある。 ・セメント工場。下水処理場予定地(Cat Lai)はこの奥。道路がないため車の通行不可。

表5-2に市内運河の水質調査結果を示す。これらの値を、日本の環境基準値およびヴェトナムの基準値 (Surface Water Quality Standard-TCVN 5942-1995) と比較すると、ほとんどすべての運河で基準を大幅に超過していることがわかる。

表5-2 ホーチミン市内運河の水質調査結果

Name of Canal	DO (mg/l)	SS (mg/l)	BOD (mg/l)	Nito (mg/l)	Photpho (mg/l)	Oil (mg/l)	E-Coli (10 ³ /100ml)
Tham Luong-Ben Cat	0.0-0.6	50-200	78-160	1.0-2.0	0.2-0.5	1-5	10-100
Tau Hu-Doi-Te	1.0-3.0	30-150	50-120	0.5-1.0	0.1-0.3	0.2-1.0	40-1000
Nhieu Loc-Thi Nghe	0.0-3.0	50-250	50-200	1-3	0.2-0.5	0.1-0.5	50-1500
Tan Hoa-Lo Gom	0.0-1.0	100-250	500-8400	2.0-5.0	0.3-1.0	0.1-0.5	1000-2000
Ben Nghe-Sai Gon	1.0-3.0	30-150	50-100	1.0-1.5	0.2-0.5	0.2-1.0	50-1000

(Source: HCM City's DOSTE,1995)

出典：Vietnam Environmental Profile, Overseas Economic Cooperation Fund,1996.

(2) 住民移転

市内流入河川や運河の堤外地に不法占拠住宅がみられる。Nhieu Loc-Thi Nghe Canal のティゲ橋付近では、不法占拠住宅は撤去され、占拠者は、背後に建築された高層住宅に移転している。また、同河川の別の場所では、不法占拠住宅の撤去が進行中である。

Nhieu Loc-Thi Nghe Canal 下水プロジェクトを担当している世銀ハノイ事務所によると、不法占拠者の世帯数は、約1万2000あり、Canal 沿いおよび新開発地に公園を建設して、移転させる予定である。再就職費用と移転費用は HCM 市が負担する予定である。これらの計画に対して、占拠者からの反対意見は一切なく、不衛生な生活から免れたいため、早く移転したいとのことである。本プロジェクトをすべて実施するには、US\$300M 必要で、うち、半分は HCM 市が負担し、不法占拠者移転費用に充てる予定。残りの半分は Canal の改善、Canal のゴミや堆積物の除去、下水処理場の建設、および排水会社の能力向上のための費用である。

本プロジェクトでは、質問票を作成し、戸別調査によって、移転対象住民の数、経済的状況などの把握を行い、それらをもとに移転対策を講じることが必要である (表5-3)。

表5-3 住民移転に関する Questionnaire の提案

- 1.0 所在地、水路との位置関係
- 2.0 回答者
- 3.0 家族構成
- 4.0 職業
- 5.0 勤務場所までの距離
- 6.0 学校までの距離
- 7.0 子供が働いている場合、勤務場所までの距離
- 8.0 その他家族が働いている場合、勤務場所までの距離
- 9.0 固定給（公務員、労働者及び退職者の月給）がある場合、その額は
- 10.0 月給がない場合、日給の額は
- 11.0 仕事がある場合、1日の収入は
- 12.0 家族の収入
- 13.0 所有地の内容
- 14.0 土地入手/借用の時期
- 15.0 1㎡当たりの土地の価格
- 16.0 あなたの見積りによる現在の土地の価格
- 17.0 家屋の所有者
- 18.0 上記家屋に住み始めた時期
- 19.0 家屋の価格
- 20.0 あなたの見積りによる現在の家屋の価格
- 21.0 所有する土地にある価値のある木
- 22.0 敷地内の養魚場
- 23.0 動物の所有
- 24.0 水路改修により所有する土地や家屋に影響があることを告げられたか
- 25.0 水路改修の賛否
- 26.0 土地の収用に対する財産への影響
- 27.0 移転を余儀なくされ、十分な補償があれば、
 - 27.1 自身で代替地/建物を見つける
 - 27.2 市が提供する移住を受け入れる
- 28.0 財産（土地/家屋）の一部が影響を受ける場合、
 - 28.1 後方に移動し、家を建て直す
 - 28.2 残りの財産を売る
- 29.0 上記残りの財産を売る場合、
 - 29.1 自身で代替地/建物を見つける
 - 29.2 市が提供する移住を受け入れる
- 30.0 プロジェクトの生活/収入への影響の有無
- 31.0 失った土地/資産からの収入の一部/全部を失うかの有無
- 32.0 上記を記述

(JICA プノンペン都市排水計画調査、1997年をもとに作成)

(3) その他

ホーチミン市には、大気汚染にかかるモニタリングステーションが4か所あり、測定項目は Dust、SO₂、NO₂、Pb および Radioactive である。測定結果は、住宅地区を除き、工場地帯は環境基準を超えている。1993年の調査結果では、ホーチミン市には80万台のオートバイ、77万台の自動車があり、そのうち自動車については約2割が整備不良、3分の2が排出ガスの許容レベルを満たしていない。今後、オートバイや自動車台数の増加により、大気汚染が深刻になってくると思われる。

ホーチミン市およびその周辺には、法律（The Council of Minister promulgated Decision, No. 194/CT dated 9th August, 1986）で指定する国立公園、自然保護地、および歴史的文化的環境地はない。

ベトナムでは多くの内外の NGO が活動している。ホーチミン市を拠点とする NGO も多く、教育、貧困、スラム、ホームレス、衛生、給水、栄養等に関する活動を行っている。それらのうち、環境保全に関する NGO には、ENDA (Environmental Development Action in the Third World)、および EED (Enfants et developpement) がある。

5-2 環境関連法制度

(1) 法制度

国レベルでは、環境保護法（Law on Environmental Protection、1993年12月制定）および環境保護に関する法律の実施に関する政府政令（実施令）（Government Decree on providing Guidance for the Implementation of the Law on Environmental Protection、1994年10月制定）がある。地方の各省や市では、国レベルの法規制より早い時期から独自の規則を設けているところが少なくない。

○ ホーチミン市環境汚染対策規則（Regulations on Environmental Pollution Control in Ho Chi Minh City、1993年5月制定）

総則、環境基準、環境管理制度、環境基準違反对策および施行条項の5章からなる。第2章第6条には、排水基準を規定している。排水基準は、排出先を公共下水道、第1種水源（飲料、調理など生活用水の供給源）および第2種水源（その他の用途の水源）の3種に分類し、31項目について定めている（表5-4）。

表5-4 ホーチミン市排水基準

Items	Unit	Limit for discharge into		
		Public sewer	Watercourse of	
			I	II
pH	—	6-9	6-9	6-9
BOD	mg/l	200	20	60
COD	mg/l	350	60	100
Total suspended solids	mg/l	100	30	50
Cyanide (CN)	mg/l	1	0.1	0.1
Arsenic (As)	mg/l	3	0.05	1
Cadmium (Cd)	mg/l	0.5	0.01	0.1
Mercury (Hg)	mg/l	0.5	0.001	0.05
Zinc (Zn)	mg/l	6	0.5	1
その他22項目				

Class I : Surface water for drinking, cooking and daily activities

Class II : Other source of surface water

環境アセスメント(EIA)にかかわる規定には、環境保護法、環境保護に関する法律の実施に関する政府政令(実施令)、および科学技術環境省回状第715号(Instruction for Guidance on setting up and appraising the Report of Environmental Impact Assessment to the Direct Foreign Investment Project、1995年4月制定)がある。環境保護法の第17条と第18条には、既存および新規の社会活動についてEIA報告書の提出が規定されている。この環境保護法の実施促進のために実施令が制定され、第3章の第9項から第20項にEIA実施に関する規定がある。回状第715号は、この実施令のEIAに関する規定について、外国投資家の場合を対象に補正する内容となっている。

本プロジェクトは、実施令第9条に示す「市が行う社会経済開発事業」ということで、EIA対象事業となる。実施令附属書IIには、EIAの対象事業(計41事業)と責任範囲(MOSTEかDOSTE)が具体的に表で示されている。表には本プロジェクトに相当するものに「住民移転」があり、移転戸数が500戸以上はMOSTE、500戸未満はDOSTEがEIA審査に責任をもつことになっている。

ホーチミン市環境委員会(ENCO: Environmental Committee of Ho Chi Minh City)での聞き取りによると、ENCOは本プロジェクトの環境管理機関、協力機関となり、M/Pの意見交換、コメント等を行い、F/Sの内容を意見する。本プロジェクトのEIA審査は、MOSTEの環境総局(ハノイ)が行う予定であり、ENCOは審査委員会の委員になる。

環境保全センター(EPC: Environmental Protection Center)は、EIA報告書(火力発電所、高速道路、セメント工場等)を多く所有しており、これらを活用できる。今までに、EIAは、

約300件の実績がある。日本企業関連では自動車、石油、肥料工場のEIAを担当した。現在も、自動車工場のEIAを実施中である。

(2) 組織

○ ホーチミン市環境委員会 (ENCO : Environmental Committee of Ho Chi Minh City)

ENCOの設立目的は、ホーチミン市の環境を管理することであり、委員長は、人民委員会副委員長のVu Hung Viet氏である。委員は、市の22区長、市の各行政部局の副部長級から構成されている。ENCOは国家の環境管理機関で、工業、商業、農業活動すべての環境管理の監査役である。ENCOは本プロジェクトの環境管理機関、協力機関となっており、M/Pの意見交換、コメント等を行い、F/Sの内容を意見することになる。本プロジェクトのEIA審査は、MOSTEの環境総局（ハノイ）が行う予定である。ENCOは審査機関の委員になる。

○ ホーチミン市科学技術環境部 (DOSTE : Department of Science, Technology and Environment)

市DOSTEは、350名の職員を有し、そのうち100名あまりがマスター、ドクターを有する。年間予算はUS\$2.5M相当で、そのうちUS\$2Mが環境関連の調査等の業務費にあてられる。大気、水質モニタリングネットワークの管理、汚染源工場の同定（“Black Book”の作成）や取り締まりなども行われている。人員規模からすれば、ハノイ市DOSTEや中央政府のNEA (National Environmental Agency) よりも大きく、ベトナム最大の環境行政組織である。

○ 環境保全センター (EPC : Environmental Protection Center)

本センターは、VITTEP : Institute for Tropical technology and Environmental Protection of Vietnamの一組織であり、ベトナムの最初の環境保全センターとして、1984年に国連の支援によって設立された。センターはダナン市からベトナム国南端までのモニタリングの責任を負う。ホーチミン市では、ホーチミン市環境モニタリングシステム (Ho Chi Minh City Environmental Monitoring System : HEMS) が1993年に構築され、以来センターで運営されている。ニューロック、サイゴン、ドンナイ川の水質データに関しては、他機関の行った調査結果を含め、多く所有する。また、EIAは、今までに約300件の実績がある。人材育成のための研修を年に10コース行っている。

○ 環境技術センター (CEFINEA : Center for Environmental Technology)

本センターは、特に工業団地や自然環境保全にかかる調査を目的としている。環境技術センターのほかに、自然資源センターおよび農林水産業環境保全センターがある。環境技術センターがそれらのリーダーとして機能している。センターの職員は48名で、全員が大

学卒、留学経験を有するものがある。このうち、4名がドクター、16名がマスター、残りは大卒である。全員が環境保全分野を専門とし、排水分野、上水分野の専門家が多い。排水・水環境室があり、本プロジェクトの一部を委託できる。

環境技術センターは、環境モニタリングセンターとして機能し、サイゴン川、ドンナイ川のモニタリングステーションを有する。これらのデータは、EIAに活用されている。水処理、水環境管理計画作成に参加した経験を有す。また、工業団地からの排水処理分野にかかわった。現在、パイロット案件を実施。100m³/日のパイロットプラントで、活性汚泥法も実験している。

環境技術センターは、人材育成のための研修機関でもある。研修は、40～60人/年の大学レベル、および20～25人/年の大学院レベルのものを実施している。研修項目は、水質、水環境、排水処理、廃棄物、大気汚染である。特に、水質、排水処理が半分以上を占める。

5-3 環境予備調査の結果

(1) 環境配慮ガイドラインに基づく調査結果

開発調査環境配慮ガイドライン「下水道」(国際協力事業団編、1994年1月)に従い、環境予備調査を行った。環境予備調査は、事前調査の段階で実施する環境調査であり、当該プロジェクトの環境影響に関するスクリーニングおよびスコーピングを行うものである。

1) プロジェクト概要およびプロジェクト立地環境

プロジェクト概要およびプロジェクト立地環境は、スクリーニングおよびスコーピングを行うための判断材料となるものである。

プロジェクト概要を表5-5に示す。また、プロジェクト立地環境を表5-6に示す。

2) スクリーニング結果

スクリーニングとは、環境インパクト調査の実施が必要となる開発プロジェクトか否かの判断を行うこと、と定義されている。

スクリーニングとスコーピングを現地踏査、UPI担当者からの聞き取り、収集資料結果等に基づき行った。

スクリーニング結果を表5-7に示す。表によると、プロジェクトの実施が住民移転、水質汚濁などの重要な環境項目に影響を与えることが予測された。

表5-5 プロジェクト概要

項 目	内 容
プロジェクト名	ヴェトナム国ホーチミン市都市排水整備計画調査
背 景	同市の排水施設は、人口増加に伴い許容範囲を超え、施設も老朽化している。また、浸水時には汚水が溢れ出し、住民の健康悪化や水質汚濁等の環境問題を引き起こしている。
目 的	ホーチミン市を対象とした都市排水整備にかかるマスタープランの策定、優先プロジェクトに関するフィージビリティ調査の実施
位 置	ホーチミン市市街地およびその近郊
実施機関	ホーチミン市人民委員会
裨益人口	不明 ただし、ホーチミン市人口約500万人（1996年）、750万人（2010年予測）
計画諸元	
計画の種類	都市排水施設および維持管理用機器等の整備
対象区域	市中心部周辺650km ² (サイゴン-ニャベ川とドンナイ川を含む)
排除方式	合流式、将来は分流式も検討
処理場	処理場設置を検討
汚泥処理、処分方式	
管渠延長等	水路改修延長 未定 ただし、現状の管渠延長約900km
放流水域等	放流水域：未定 放流水質：未定
その他特記すべき事項	

表5-6 プロジェクト立地環境

項 目	内 容	
プロジェクト名	ホーチミン市都市排水整備計画調査	
社会環境	地域住民 (居住者/先住民/計画に対する意識等)	都市型住民、貧困地帯あり
	土地利用 (都市/農村/史跡/景勝地/病院等)	都市、水路沿いにスラム住宅
	経済/交通 (商業/農漁業・工業団地/バスターミナル等)	商業、住宅地域等
自然環境	地形・地質 (急傾斜地・軟弱地盤・湿地/断層等)	市街地は標高2m以上、周辺は低地で浸水問題が深刻なところあり
	海岸・海域の状況 (浸食・堆砂/潮流・潮汐等)	河川は感潮河川
	貴重な動植物・生息域 (自然公園・指定種の生息域等)	不明
公害	苦情の発生状況 (関心の高い公害等)	ゴミ問題、水質汚濁が深刻
	対応の状況 (制度的な対策/補償等)	特になし
その他特記すべき事項	特になし	

表5-7 スクリーニング結果

	環境項目	内 容	評 定	備 考 (根拠)
社 会 環 境	1 住民移転	用地占有に伴う移転 (居住権、土地所有権の転換)	○有・無・不明	川地に住居が分布
	2 経済活動	土地等の生産機会の喪失、経済構造の変化	有・○無・不明	移転対象者に影響がある
	3 交通・生活施設	渋滞・事故等既存交通や学校・病院等への影響	○有・無・不明	下水管渠の敷設工事に伴う道路占有がある
	4 地域分断	交通の阻害による地域社会の分断	有・○無・不明	大規模施設はない
	5 遺跡・文化財	寺院仏閣・埋蔵文化財等の損失や価値の減少	有・無・○不明	埋蔵文化財が不明
	6 水利権・入会権	漁業権、水利権、山林入会権等の阻害	有・無・○不明	水利用に影響がある
	7 保健衛生	ゴミや衛生害虫の発生等衛生環境の悪化	有・○無・不明	ゴミ等の大量発生はない
	8 廃棄物	建設廃材・残土、一般廃棄物等の発生	○有・無・不明	改修工事に伴う残土、河川底泥の発生
	9 災害 (リスク)	地盤崩壊・落盤、事故等の危険性の増大	有・○無・不明	大規模造成はない
自 然 環 境	10 地形・地質	掘削・盛土等による価値のある地形・地質の改変	有・○無・不明	大規模造成はない
	11 土壌浸食	土地造成・森林伐採後の雨水による表土流出	有・○無・不明	大規模造成はない
	12 地下水	掘削工事の排水等による枯渇、浸出水による汚染	有・○無・不明	大規模掘削はない
	13 湖沼・河川流況	埋立や排水の流入による流量、水質の変化	○有・無・不明	埋立や排水流入がある
	14 海岸・海域	埋立地や海況の変化による海岸浸食や堆積	有・○無・不明	流況を変化させる埋立工事や施設はない
	15 動植物	生息条件の変化による繁殖阻害、種の絶滅	有・無・○不明	貴重な動植物の生息は不明
	16 気象	大規模造成や建築物による気温、風況等の変化	有・○無・不明	大規模な構築物はない
公 害	17 景観	造成による地形変化、構造物による調和の阻害	有・○無・不明	景観的に重要な地域はない
	18 大気汚染	車両や工場からの排出ガス、有毒ガスによる汚染	○有・無・不明	工事用車両の通行に伴う粉じんの発生
	19 水質汚濁	土砂や工場排水等の流入による汚染	○有・無・不明	河川の浚渫や護岸工事
	20 土壌汚染	排水・有害物質等の流出・拡散等による汚染	有・無・○不明	土壌汚染を引き起こすかどうか不明
	21 騒音・振動	下水処理場等による騒音・振動の発生	○有・無・不明	下水処理場、ポンプ場の工事と稼働
	22 地盤沈下	地盤変状や地下水位低下に伴う地表面の沈下	有・○無・不明	地下水の大規模な揚水はしない
	23 悪臭	下水処理場の稼働に伴う悪臭の発生	○有・無・不明	処理場から悪臭発生のおそれがある

総合評価：IEEあるいはEIAの実施が必要となる開発プロジェクトか ○要・不要 影響の考えられる項目が多くある

3) スコーピング結果

スコーピングとは開発プロジェクトの考え得る環境インパクトのうち、重要と思われるものを見だし、それを踏まえて環境インパクト調査の重点分野あるいは重点項目を明確にすること、と定義されている。

スコーピング結果を表5-8に示す。表によると、重大なインパクトが見込まれる項目として「住民移転」、多少のインパクトが見込まれる項目として「交通・生活施設」「廃棄物」「湖沼・河川流況」「大気汚染」「水質汚濁」「騒音・振動」「悪臭」、さらに不明な項目として「遺跡・文化財」「水利権・入会権」「動植物」「土壌汚染」があげられた。

表5-8 スコーピング結果

環境項目		評定	根拠	
社会	1	住民移転	A	移転住民の生活基盤の喪失
	2	経済活動	D	マイナスのインパクトは考えられない
	3	交通・生活施設	B	下水管渠の敷設工事に伴う道路占有がある
	4	地域分断	D	地域を分断する施設はない
	5	遺跡・文化財	C	埋蔵文化財が不明
環境	6	水利権・入会権	C	水利用に影響がある
	7	保健衛生	D	保健衛生状況は悪化しない
	8	廃棄物	B	工事中の残土、河川汚泥の発生
	9	災害(リスク)	D	平坦地で大規模な切土等を行わない
	10	地形・地質	D	大規模な地形改変はしない
自然環境	11	土壌侵食	D	大規模な地形改変、植生除去を行わない
	12	地下水	D	影響を与える工事、施設はない
	13	湖沼・河川流況	B	処理水の放流による流況、水質の変化
	14	海岸・海域	D	海岸の地形や海況を変化させる工事や施設はない
	15	動植物	C	貴重な動植物の生息は不明
公害	16	気象	D	気象への影響は考えられない
	17	景観	D	景観的に重要な地域はない
	18	大気汚染	B	工事用車両の通行に伴う粉じんの発生
	19	水質汚濁	B	工事中の水質汚濁が考えられる
	20	土壌汚染	C	有害物質の発生が不明
	21	騒音・振動	B	下水処理場、ポンプ場の工事と稼働
	22	地盤沈下	D	大規模な地下水揚水はしない
	23	悪臭	B	処理場から悪臭発生の恐れがある

評定の区分：A：重大なインパクトが見込まれる

B：多少のインパクトが見込まれる

C：不明（検討をする必要はあり、調査が進むにつれて明らかになる場合も十分に考慮に入れておくものとする）

D：ほとんどインパクトは考えられないためIEEあるいはEIAの対象としない

4) 環境分野における本格調査の方針

評定した環境項目について本格調査の方針を表5-9に示す。

表5-9 本格調査の方針

環境項目	評定	本格調査の方針	備考
1 住民移転	A	移転対象地域の現況調査、住民移転計画の策定	不法居住者への配慮
3 交通・生活施設	B	交通現況、将来土地利用、交通計画調査	資料調査による
8 廃棄物	B	建設残土等発生量の把握、廃棄物処分計画の策定	別途実施の工事計画作成結果使用
13 湖沼・河川流況	B	不定流解析、水質調査解析等	別途実施の水理・水質調査結果使用
18 大気汚染	B	大気汚染に対する住民の意識調査	苦情等の資料調査による
19 水質汚濁	B	水質、底質の現況調査、水質汚染予測	排水の1次処理や希釈効果を予測
21 騒音・振動	B	土地利用現況調査、貴重な野生動物の生息状況	資料調査および動植物調査結果を使用
23 悪臭	B	類似施設（処理場、開渠・暗渠）の現況調査、気象調査	資料調査による
5 遺跡・文化財	C	文化財関連法規の調査、保護あるいは移転工事計画、工法	資料調査による
6 水利権・入会権	C	水利権・入会権調査、水利用の現況調査	資料調査による
15 動植物	C	貴重動植物の調査、地域住民の利用状況	資料調査による
20 土壌汚染	C	河川、湖沼の底質調査、浚渫土砂対策	

評定の区分：A：重大なインパクトが見込まれる

B：多少のインパクトが見込まれる

C：不明（検討をする必要はあり、調査が進むにつれて明らかになる場合も十分に考慮に入れておくものとする）

D：ほとんどインパクトは考えられないためIEEあるいはEIAの対象としない

第6章 本格調査の基本方針

6-1 本格調査の目的

- (1) ホーチミン市の都市部（約140km²）および都市開発計画が予定されている都市部周辺地域（約510km²）を対象とした下水道整備にかかるマスタープランを策定し、選定された優先プロジェクトのフィージビリティ調査を実施することを目的とする。
- (2) 本件調査を通じて、ベトナム国側カウンターパートに対して技術移転を行う。

6-2 調査対象地域

ホーチミン市の既存市街地である都市部約140km²、および2020年を目標とした都市開発計画が予定されている都市部周辺地域約510km²を対象とする。これは S/W の“Appendix 1”のとおりである。

6-3 基本方針および留意事項

6-3-1 調査の基本方針

(1) 都市排水および汚水処理を含む下水道の計画策定

事前調査の当初は、ホーチミン市の都市排水問題に焦点を当てて実施することを検討していたが、現地調査を通じ、ホーチミン市の水環境の状況が極めて劣悪であることが確認されるとともに、ホーチミン市ではすでに下水道整備の計画を策定中であり、下水道計画の必要性が確認された。他方、ホーチミン市の浸水被害状況についても恒常的被害がみられ、潮位変動の影響、排水施設の不足・老朽化などにより、大きな問題となっている。したがって、本格調査においては、都市排水および下水道を対象に調査を実施する必要がある。

(2) 下水道計画のあり方の提示と段階的整備計画の策定

目標年次および中間年次における達成可能な現実的計画を策定するとともに、ホーチミン市の下水道計画としてあるべき姿も描くこととする。

(3) 既存施設の活用と経済的な計画策定

既存施設を最大限有効に活用し、調査対象地域の地域特性に適合した計画を策定するとともに、建設面および管理面も考慮した経済的な計画を策定する。

(4) 個別処理と集合処理の検討

調査対象地域における個別処理区域と集合処理区域の再検討を行うとともに、適正な衛生処理のあり方についても検討する。

(5) 適正な排除方式および処理方式の検討

ホーチミン市においては、既存市街地域は合流式であり、また新規開発地域においては分流式による排除方式を基本としているが、本格調査においては、いずれの方式が適当なのか再検討することとし、また、処理方式についても、ホーチミン市の地域特性に適合した方式を取るよう十分に検討する。

(6) 事業実施体の検討と技術移転の充実

ホーチミン市においては、現在下水道事業を実施するための事業実施体は存在しておらず、下水道事業を実施することはホーチミン市にとって初めての経験となる。ついでに、本格調査を通じ、下水道事業体のあり方を提示し、カウンターパート機関のキャパシティー構築を図り、必要最低限の実施体制を付与する必要がある。

6-3-2 調査実施上の留意点

開発調査を行うにあたって、以下の点に留意して調査を実施する必要がある。

(1) 速やかな事業化への配慮

ホーチミン市の都市の規模、問題の深刻度から開発調査終了後の早期の事業化が必要と考えられることから、先方の意向および資金調達の見込みなどを十分に確認して事業化の実現を十分考慮した調査を進める必要がある。

(2) 環境配慮

本件調査は、環境予備調査の結果にもあるとおり、住民移転が大きな問題となることが想定され、海外経済協力基金（OECF）などによる海外からの資金による事業化を想定した場合、これまで以上に環境配慮は重要な要素となっていることから、初期環境調査（IEE）、環境影響評価調査（EIA）などにおいてこの点を十分考慮して調査する必要がある。

(3) 技術移転ワークショップの充実

ホーチミン市では、都市排水および下水道事業に従事する関係機関は多岐にわたっており、また、下水処理場などによる本格的汚水処理はこれまで事業実施の経験がないことから、関係機関の調整、役割の明確化、下水道事業体の形成などが重要となるとともに、下

水道事業について基本的な事項から十分に技術移転を図る必要がある。したがって、調査の段階に応じ技術移転ミニワークショップを行い、関係機関の調整・住み分け、下水道事業の技術移転を実施することが肝要である。また、技術移転セミナーについても、十分に準備を行いプレゼンテーションにも留意して、効果的なセミナーを実施する必要がある。

(4) 他援助機関との連絡・調整

本調査の対象地域内には、世界銀行（WB）、アジア開発銀行（ADB）、ベルギーなどの種々の国際機関、援助機関がさまざまな協力を実施しているため、これらの機関と十分に情報交換を行い動向を把握し本件調査に反映させるとともに、必要に応じ調査の成果および進捗状況などの情報提供を実施し調整を図る。

6-4 調査項目

フェーズⅠ：マスタープランの策定

[基礎調査]

(1) 既存資料の収集・分析

〈自然条件〉

調査対象地域の地形図、航空写真

気象・水文関係資料

地質・土質関係資料

河川・水路の縦横断面図

水質関係資料

貴重な動植物種の資料

〈社会条件〉

人口・人口密度・人口分布・人口推移

産業（工業・観光・農業等）の現況と将来計画

経済予測・計画

土地利用状況／資産

関連開発計画（上水道・河川・都市・工業・農業・道路）

河川・湖沼・遊水池・周辺水路の利水状況

給水状況

洪水・浸水の記録および被害状況

公衆衛生関連資料

地下水利用状況

工業排水関連資料

道路交通量・舟運関連資料

電力供給状況

〈関連施設の状況〉

既存排水施設および運営・維持管理に関する資料

既存下水処理施設および運営・維持管理に関する資料

既存排水・下水処理施設設計基準

非構造物対策に関する資料

地下埋設物関連資料

便所・し尿処理施設関連資料

ゴミ処理関連資料

〈組織・制度〉

排水・下水処理関係機関

環境関係機関

利水関係機関

排水・下水関係法律

環境関係法律

ホーチミン市財政関連資料

事業主体の財政状況

〈他援助機関の動向〉

(2) 現地踏査

調査対象地域の地形確認

排水・下水処理状況の確認

洪水氾濫・浸水被害状況の確認

気象・水文観測所の確認

既存排水・下水処理施設の状況の確認

処理場・ポンプ場

水質汚濁源の確認

公衆衛生状況の確認

(3) 地形測量

河川・水路の縦横断測量

輪中堤・道路等の縦横断測量

- (4) 地質・土質調査（必要に応じ）
- (5) 衛生・環境調査
 - 水質調査
 - 底質調査
 - 水利用現況調査
 - 住民移転調査
 - 汚濁源・汚濁負荷量調査
- (6) 排水・下水処理システム調査
 - し尿処理設備・排水路浄化機能調査
 - 既存排水路流下能力調査
- (7) 経済・社会調査
- (8) 土地利用調査
- (9) 浸水状況（将来予測含む）／被害調査
- (10) 将来水質調査
- (11) 基礎調査結果の解析・検討

[マスタープランの策定]

- (1) 流出解析
- (2) 水質汚濁解析
- (3) 計画降雨解析計画排水量の算定
- (4) 排水・汚水処理方法の検討
- (5) 計画基本方針の設定
 - 目標年次
 - 社会・経済計画フレーム
 - 計画規模
 - 計画排水・汚水処理区分の設定
 - 計画排水量の設定
 - 水質基準
- (6) 構造物対策の検討
- (7) 非構造物対策の検討
- (8) 代替案の検討・最適案の選定
- (9) 初期環境調査（IEE）
- (10) 施設概略計画の策定

- (11) 運営・維持管理計画の策定
- (12) 組織・制度改善計画の策定
- (13) 事業費概算・資金計画の策定
- (14) M/P 評価（経済、環境、社会、技術等）
- (15) 段階別実施計画の策定
- (16) 優先プロジェクトの選定

フェーズⅡ：優先プロジェクトに対するフィージビリティ調査

- (1) 補足資料の収集・分析
- (2) 補足実査（地質・土質調査、測量等）
- (3) 計画諸元の詳細設定
- (4) 施設設計
- (5) 施工計画（資機材調達計画含む）
- (6) 運営・維持管理計画
- (7) 事業費積算・資金計画
- (8) 環境影響評価調査（EIA）
- (9) 事業評価（経済、財務、環境、社会、技術）
- (10) 事業実施計画策定
- (11) 提言

6-5 調査工程

調査工程は、S/W のとおり全体でおおむね23か月とする。全体調査工程は次のとおりである。

項目	平成9年度			平成10年度									平成11年度																
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
事前調査 (S/W協議)																													
現地調査																													
国内作業																													
報告書																													
フェーズ																													

6-6 調査団構成

調査団は、おおむね以下の要員により構成される。

- (1) 総括
- (2) 下水道計画
- (3) 都市排水計画
- (4) 水文・水理
- (5) 施設計画・設計（都市排水）
- (6) 施設計画・設計（下水道）
- (7) 施工計画・積算
- (8) 水環境・社会配慮
- (9) 都市計画
- (10) 地形測量
- (11) 地質・土質
- (12) 運営・維持管理計画
- (13) 組織・法制度
- (14) 経済・財務分析

6-7 調査実施体制

6-7-1 カウンターパート機関

カウンターパート（C/P）機関はホーチミン市の地方行政機関であるホーチミン市人民委員会（PCHCM）となる。今回の事前調査においては、Urban Planning Institute（UPI）が交渉の担当機関となり協議を行ったが、本格調査においては関係機関により組織される Project Management Unit（PMU）を設置し、これが C/P 機関となることを M/M で確認した。PCHCM 内の本件調査関係機関としては、Chief Architect Office、計画投資局、運輸公共事業局、Environment Committee of HCM City（ENCO）、科学技術環境局（DOSTE）、農業地域開発局などがあげられ、さらには Urban Drainage Company なども密接に関連すると思われる。

6-7-2 ステアリング・コミッティ

本件調査の C/P 機関は、地方行政機関である HCMPC であるが、調査の円滑な実施、調査終了後の事業化などを勧案すると、中央政府機関との調整が重要となることから、ヴィエトナム国側と協議してステアリング・コミッティを設置することとした。しかしながら、計画投資省（援助窓口）はメンバーとすることで合意したものの、建設省、農業農村開発省、科学技術環境省などの他の関係機関についてはメンバーとすることで合意していないため、本

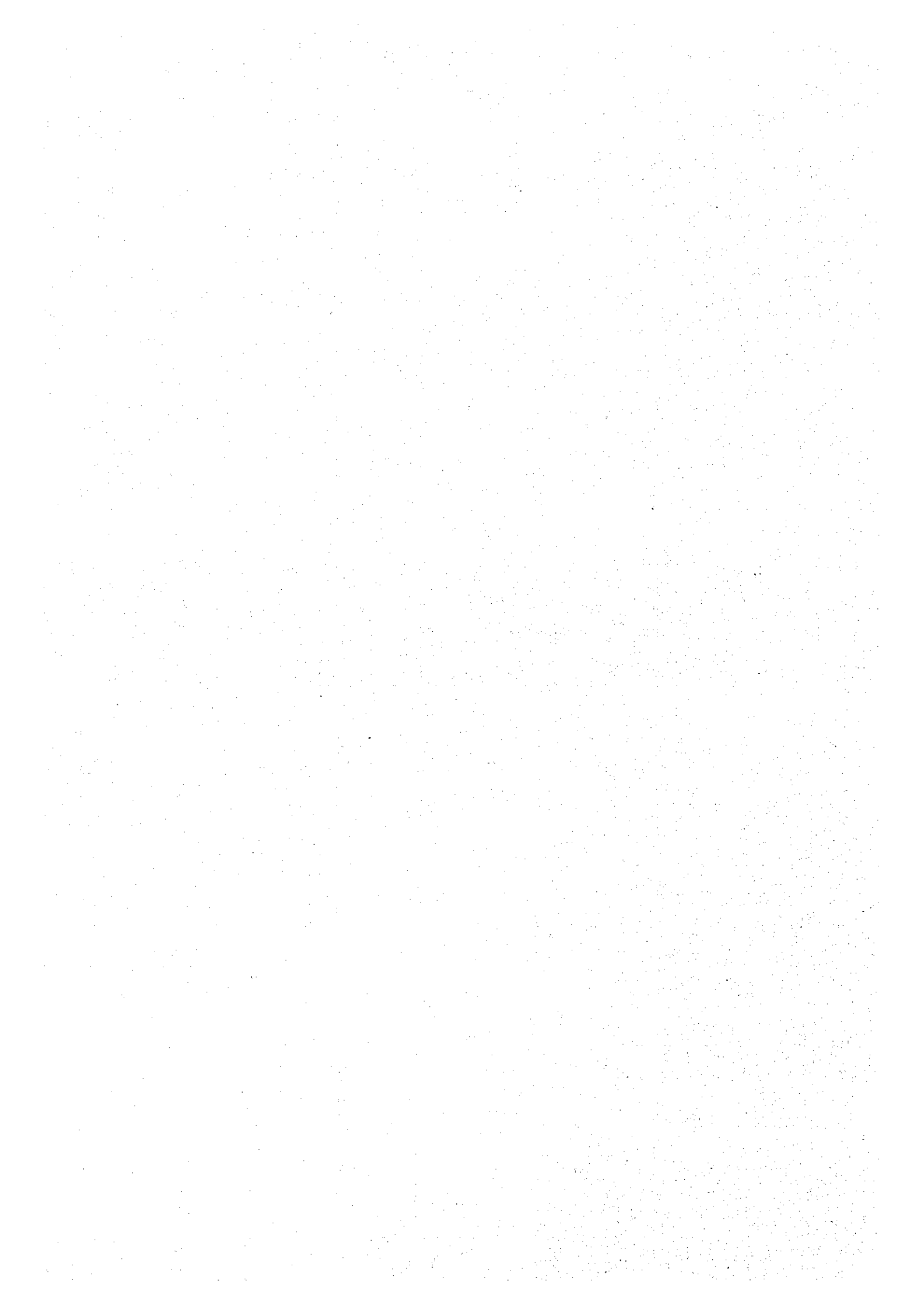
格調査開始時に再確認する必要がある。

6-8 ローカルコンサルタント

ベトナム国における本調査と関連のあるローカルコンサルタントは、おおむね付属資料6のとおりである。

付 属 資 料

- 1 ヴィエトナム国政府要請書
- 2 SCOPE OF WORK
- 3 MINUTES OF MEETINGS
- 4 質問表および回答
- 5 主要面会者リスト
- 6 ローカルコンサルタントのリスト
- 7 収集資料リスト
- 8 現地踏査結果の概要



付属資料1 ヴィエトナム国政府要請書

THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF VIETNAM
THE PEOPLE'S COMMITTEE OF HO CHI MINH CITY

APPLICATION FOR TECHNICAL ASSISTANCE
OF
THE GOVERNMENT OF JAPAN
FOR
STUDY ON URBAN DRAINAGE AND WATER ENVIRONMENT IMPROVEMENT
IN
HO CHI MINH CITY

1. PROGRAM DIGEST OF TECHNICAL ASSISTANCE
2. TERMS OF REFERENCE

OCTOBER, 1996

URBAN PLANNING INSTITUTE OF HCM CITY
IN COOPERATION WITH
THE METROPOLITAN DRAINAGE COMPANY HCMC

PROGRAM DIGEST OF TECHNICAL COOPERATION
FOR
STUDY ON URBAN DRAINAGE AND WATER ENVIRONMENT IMPROVEMENT
IN HOCHIMINH CITY

1. STUDY TITLE : Study on Urban Drainage and Water Environment Improvement in Ho Chi Minh City.

2. LOCATION : Urbanized area (*about 140 Km²*) and its surroundings (*about 510 Km²*) in Ho Chi Minh City.

3. EXECUTING AND IMPLEMENTING AGENCIES:

- ♦ EXECUTING AGENCY: People's Committee of Ho Chi Minh City.
- ♦ IMPLEMENTING AGENCY: Urban Planning Institute of HCM City in cooperation with the Metropolitan Drainage Company HCMC and other institutions /organizations concerned.

4. OBJECTIVES OF THE STUDY:

The flood protected and environmental improvement program with adequate maintaining good socio-economic activities and wastewater disposal facilities in the basic condition for maintaining good socio-economic activities and amenity of the largest City of Vietnam.

The low-lying areas of the city (*over 50 % of the total area of developed city*) is affected by the semi -diurnal tied of the China Sea. Heavy monsoon rains in concurrent with inadequate drainage systems cause water logging in many places within the city. In the present, there exist 54 inundation prone areas (*23 estates*) in the city.

In addition, the rivers and canals in those areas are heavily polluted due to the rapid urbanization without any significant proper measurer of water pollution control.

At present, all domestic wastewater and industrial sewage of HCM city are discharged into surface water drainage system and rivers with inadequate or without treatment. There are no sewage treatment plants in the city and even factories and hospitals (*except Choray hospital and Heineken Beer factory*) do not

make preliminary sewage treatment before it is discharged into the city drainage and for canal systems.

The frequent flooding and water logging carry and spread the stinking, heavily polluted wastes to the city areas. There is a high incidence of water - borne disease and illness in the areas. These phenomena of flooding and water urbanization in the low - lying areas, if adequate drainage and wastewater disposal systems are not provided.

Accordingly, both the central and local Governments are wishing to prepare a integrated Master Plan for urban drainage and water environment improvement in Ho Chi Minh City and conduct the Feasibility Study for drainage project selected through the Master Plan Study under the Japanese technical assistance.

The adjoining Terms of Reference outlines the scope of Study.

6. IMPLEMENTATION PERIOD : About 24 months.

7. REQUIRED EXPERT INPUT ESTIMATED :

About 140 man-month of total expert assignment for the Study.

8. RELEVANT URBAN DEVELOPMENT PROJECTS :

The captured project related to the other Urban development projects in Ho Chi Minh City. The tables attached as ANNEX - 1 shows the outline of the relevant projects and their present status.

People's Committee of HCM City.

SOCIALIST REPUBLIC OF VIETNAM
PEOPLE'S COMMITTEE OF HO CHI MINH CITY

TERMS OF REFERENCE
FOR

THE STUDY ON URBAN DRAINAGE AND WATER ENVIRONMENT IMPROVEMENT

IN
HO CHI MINH CITY.

OCTOBER 1996

URBAN PLANNING INSTITUTE OF HO CHI MINH CITY
IN COOPERATION WITH THE METROPOLITAN DRAINAGE COMPANY

TERMS OF REFERENCE
FOR
THE STUDY ON URBAN DRAINAGE AND ENVIRONMENT IMPROVEMENT
IN HO CHI MINH CITY

1. INTRODUCTION.

The Government of Vietnam approved the "Vietnam National Plan for Environmental and Sustainable Development" in 1992. The Plan emphasizes the need for the preparation and implementation of environmental protection and improvement measures in the major cities (*HCM city is one of these*) in order to upgrade quality of life and optimize the economic development. The Plan highlights the existing environmental deterioration problem which results in deleterious effects on the health of a large number of people. The need for tackling these problems and a plan to deal with the rapid urban and industrial growth in HCM city is very urgent. Particularly for the serious drainage and water pollution problems.

As part of the above plan, the Government desires to prepare a Master Plan and also to carry out the Feasibility Study for an integrated improvement and development program for Urban Drainage and Water Environment Improvement in HCM City. This study includes an objective to enhance the technical of local Government staff in line with principle of the Integrated Urban Development Program.

The Government of Vietnam intends to request the Government of Japan for the technical assistance to conduct the Master Plan Study as well as Feasibility Study in accordance with the present terms of reference.

2. BACKGROUND INFORMATION.

Ho Chi Minh city, the largest city of Vietnam, is located in the northern part of the country at longitude 10°50' N and latitude 106°40' E. It plays an important role as a socio-economic center in the south of the country. The city is also considered to be a cultural, technical and scientific center and international trade metropolis. The study area covering urbanized area of 160 Km² encompasses 12 inner districts and the surrounding areas. The area is characterized by rapid urbanization with high population growth rate. The population in the urban area has increased from 540,000 in 1939 to 3,200,000 in 1989, almost six (6) times in 50 years.

According to the Amendment of City's Master Plan, the urban area will be 650 Km² with a population of 7.5 millions in the year 2010 (see ANNEX - 2). However, various problems have been posed with the progress of urbanization, especially the urban drainage and water environmental problem is quite serious.

The drainage/sewerage system of the city common for both rainwater and sewage. The original system was constructed in 1870's by the French Government and

expansion works were carried out from 1950 to 1975 by the United States Government. The former system was just planned for a population of 1.5 million.

There exist 54 inundation prone areas (23 estates) in the city. In these areas, the inundation caused by of the rainstorm usually lasts for one to two days. The reasons of the inundation and pollution are described as follows:

- (1) The ground level of Ho Chi Minh city is generally low, it is therefore easily affected by the semi-diurnal tide of the China Sea. Over 50 percent of the total area of developed HCM city are less than 2 meters above mean sea level (MSL), where it is affected by the tidal Saigon river. The majority of the sewer outfalls in HCM city are at, or usually below the MSL. This means that the sewer outfalls are submerged during the high tide.
- (2) The annual rainfall is relatively high (about 2,000mm) and it concentrates in the wet season which is from May through December (over 90 percent of the annual rainfall can be recorded in this season).
- (3) At present, all domestic wastewater and industrial sewer of HCM city are discharged into surface water drainage system and then poured into the Saigon River in the end without formal treatment except the local treatment by septic tanks for a small part of domestic wastewater amount. There are approximately 700 Km of sewer in total consisting of many different types and sizes. The average sewer density is about 77 meters per hectare which means that the existing system has not enough capacity for the proper urban drainage.
- (4) Salutation of existing drainage facilities and blockage of 25 key floodgates are mainly attributable to the inadequate maintenance of the system due to the lack of proper equipment, rendering it incapable of fulfilling its function for stormwater drainage.
- (5) The encroachment of about 16,000 houses (100,000 people) onto drainage areas worsens the above situation.

Pollution of surface water resources by urban and industrial wastewater is also very serious and will be considered to be the most critical environmental problem in the city. There are nose wage treatment plants in the city, and even factories and hospitals (except Choray hospital and Heineken Beer factory) do not make preliminary water treatment before it is discharged into the drain channels. About 16 percent of urban population are served by water-borne sewerage systems. Septic tanks are owned by 32 percent of the population, double vault latrine by 21 percent and the bucket latrines by 23 percent. For the rest of 8 percent of urban residents, there exists no system of waste disposal. In view of these facts, the system does not work well when heavy rainfall comes, resulting in flooding that creates health risks and environmental pollution.

A large part of the existing sanitary and stormwater drainage networks are severely deteriorated so that shallow groundwater is contaminated due to the leak in pipes, septic tanks and chambers. As a result, shallow well is judged unsuitable as a source of drinking water. Another problem is the high groundwater table, which limits the application of low cost sanitation technology.

Under these circumstances, the study needs to be conducted at an early stage possible for the establishment of a comprehensive urban drainage water Environment improvement plan in HCM city. Since rehabilitation and/or maintenance work for the existing drainage system is urgently required in certain areas, basic design study also needs to be carried out in a selected flood prone area in the hope that the work can be implemented under the Grant Aid of the Japanese Government.

3. DESCRIPTION OF THE STUDY

3.1 Study Area

The study area covers approximately 650 Km² including urban area (140Km²) and its surrounding area (510Km²) in Ho Chi Minh City. Both the Saigon - Nhabe River and the Dong Nai River are also involved the area as shown in attached location map I.

The Feasibility Study area shall be selected from high priority districts identified in the Master Plan taking account of urgent need, benefits to be derived and an appropriate magnitude of scale of the project.

With regard to the proposed area for the Grant Aid Project, it is densely populated area where the inundation is habitually occurs in rainy season (see attached location map II).

3.2 Objective of The Study

Objectives of the study are as follows;

- (1) To formulate a Master Plan of drainage system and water environment improvement for the urban center of ho Chi Minh City and its vicinity;
- (2) To conduct a Feasibility Study for the areas selected through the Mater Plan study as the most urgent need for the improvement of drainage system;
- (3) To formulate a project for the retrieval of flood prone area which is expected to be implemented under the Grant Aid of the Japanese Government; and,
- (4) To upgrade the technical capability of the Vietnamese staff of the agencies concerned.

3.3 Executing Agency:

People's Committee of HCM City (PCHCM) will act as an executive agency and the Urban Planning Institute (UPI) under the Chief Architect Office (CAO) will act as an implementing agency this study in cooperation with Metropolitan Drainage Company-HCM city (MDC).

According to the Government policy expressed in the decree of the Council of Ministers (*Prime Minister*) through the State Planning Committee (*Ministry of Planning and Investment*) in 1988, local Government of the PCHCM is responsible for urban drainage and sewerage in HCM city, while the Ministry of Water Resources is engaged in the irrigation for agriculture development scheme and the maintenance of large rivers (*Saigon, Nhabe, Dongnai*) including flood protection.

The active involvement and cooperation of several Government agencies concerned will be required for the smooth implementation of these study. The joint efforts of such agencies concerned will be required for the smooth implementation of this study. The joint efforts of such agencies may certainly help identify the most appropriate projects and find the cost -effective solution for the existing and future urban drainage problems.

4. SCOPE OF WORK.

The plan of operation shall involve the following:

(1) Review of Related Studies and plans.

All studies and plans related to flood control and drainage/sewerage projects in the study area will be reviewed and evaluated to identify problems. Main points which shall require additional survey and investigation will be sorted out.

(2) Collection of Data and Information.

The following data and information will be collected..

- a) Topographic map and previous topographic survey results;
- b) Soil and geological conditions;
- c) Meteorology and hydrology;
- d) National and regional socio-economy;
- e) Land use and assets in the study area;
- f) Existing structures for flood control, other riparian structures and drainage/sewerage system
- g) Development plans for urban area, industries, agriculture, and roads.
- h) Inundation condition and damages;
- i) Water quality; and,
- j) Environmental condition of the study area

(3) Execution of survey and investigation.

The items specified below shall be covered by the survey and investigation required for the study I

- a) Aerial photography and mapping of the study area at a scale of 1/5.000 with contour line interval of 0.5m;
- b) Longitudinal profiling and cross - sectional surveying along the roads which major rivers in the area;
- c) Longitudinal profiling and cross-sectional surveying along the roads which function as ring dikes;
- d) Longitudinal profiling and cross-sectional surveying along the open channels;
- e) Topographical survey at the proposed sites of major structures at approx. 1/200; and,
- f) Geological and soil mechanics investigation at the proposed sites of major structures.

(4) Studies and Analyses:

The studies and analyses required for the improvement of drainage/sewerage system and water environment are as follows:

- a) Hydraulic and hydrological study;
- b) Study on problems of the existing flood control and drainage/sewerage system;
- c) Analyses of existing and future land use and flood damage in the study area;
- d) Analyses of the national and regional socio-economy;
- e) Analyses of the environmental conditions in the urban center and surrounding areas;
- f) Study on existing structures and design standards applied in Vietnam;
- g) Analyses of construction unit costs required for drainage/sewerage system and water environment improvement plan; and
- h) Comparative study on alternatives to select the optimum improvement plan, etc.

(5) Formulation of Master Plan of Drainage and Water Environment Improvement;

(6) Feasibility Study on Urgent Project.

The Feasibility Study shall be conducted for priority drainage projector selected through the Master Plan Study. The feasibility study shall cover the following:

- a) Alternative plan of drainage system;
- b) Technical analysis of optimum plan/
- c) Preliminary design and cost estimate of optimum plan/ and
- d) Justification of the project (*economic evaluation, financial availability and environmental assessment*).

(7) Basic design and plan for the project of retrieval of selected flood prone areas, which is expected to be implemented under the Grant Aid of the Japanese Government

(8) Transfer of Knowledge.

Transfer of technical knowledge shall be effected as here in described.

- a) On-the-job training to the counterpart staff of the Vietnamese Government assigned to the study; and
- b) Technical training overseas for the selected government staff to obtain abider knowledge on modern practices and techniques

5. REPORTING

The reports to be prepared, submitted and discussed during the study are as follows:

(1) Inception Report.

This report shall be submitted in twenty-five (25) copies within two(2) month after commencement of the Study. It shall present the comments and/or suggestions on previous data and study reports, and summarize findings and technical problems encountered through the field survey.

(2) Progress Report.

This report shall be submitted in twenty-five (25) copies within six (6) months after commencement of the Study. It shall give a summary of the Study term's activities, technical problems encountered, deviations from the original scope of work/services and schedule, and the program of work for the nest study period.

(3) Interim report.

This report shall be submitted in twenty-five(25) copies within eleven (11) months after commencement of the Study, giving all the results of the review, survey, investigation and analyses so far undertaken.

(4) Draft Final Report.

This report shall be submitted in fifty (50) copies within sixteen (16) months after commencement of the Study, presenting the flood control and drainage/sewerage system improvement plan, including feasibility of selected priority areas/ projects. Comments from the Government of HCM city on this report will be given to the Study Team within one (1) month after receipt of the report.

(5) Final Report

The Final Report shall be submitted in fifty (50) copies at the completion the services giving all the results of the Study.

6. STUDY SCHEDULE

The total required period for the study will be is twenty-four (24) months, of which details are as shown in Figure 1.

7. EXTERNAL AND GOVERNMENT INPUTS

7.1 External Input

(1) Engineering Services

A total 140 man-months of expert services may be required for the study. The expertise and length of service of each expert are as follows:

No	Designation	Man-month
1	Team leader/ Flood control & Drainage Planner	24
2	Sanitary/Waste Management Expert	16
3	Drainage/ River Engineer	17
4	Structural Engineer	10
5	Hydrologist	10
6	Geologist	6
7	Geodetic Engineer/Survey Expert	12
8	Institutional Expert	8
9	Construction Planner/Land-use planning Expert	5
10	Cost Estimator	5
11	Project Economist	12
12	Environmental Impact Specialist	10
13	Other Specialists (as required)	5
	Total	140

(2) Aerial Photography and Mapping,

Required includes aerial photography and mapping for an area of 650Km² at a scale of 1/5,000 with contour line intervals of 0.5m.

(3) Equipment.

Equipment required for the Study are expected to be provided through overseas aid. Such equipment are provisionally listed in Table 1.

7.2. Government Input.

For the smooth and efficient execution of the study, the Government of Vietnam will undertake the following, as and when necessary:

- (1) Provision of counterpart personnel including one project coordinator who will be responsible for the field survey and coordination of study activities throughout the study period;
- (2) Arrangements for exemption from import duties, taxes and/or levies on equipment, material, instruments and personal effects to be brought by the study Team into Viet Nam, which are necessary of the execution of the Study;

- (3) Provision of sufficient office facilities, suitably air-conditioned and with necessary furniture and fixtures, water and electric supply facilities in Ho Chi Minh City;
- (4) Provision of available documents such as report, drawings, topographic maps, statistical data and information needed for the execution of the Study; and,
- (5) Assistance in providing security to life and property of the member of the Study team during their stay in Viet Nam.

TABLE 2: LIST OF EQUIPMENT REQUIRED FOR THE STUDY

No	Item	Quantity
1	Electro-Optical Distance Meter	2 units
2	Transit with Tripod	2 units
3	Level with Tripod	2 units
4	Hand Level	2 units
5	Leveling Staff	4 units
6	Pole	10 units
7	Binoculars	1 sets
8	Mirror Stereoscope	1 sets
9	Walkie - Talkies	2 units
10	Current Meter	2 units
11	Drafting Equipment	2 sets
12	Personal Computer with Printer and Software	3 sets
13	Photocopy Machine	2 sets
14	Vehicle (4-Wheel Drive)	4 units
15	Automatic Recording Water Level Gauge	3 sets
16	Staff Gauge for Water Level	6 sets
17	Automatic Rainfall Gauge	5 sets
18	Portable pH Meter	2 sets
19	Portable Turbidity Meter	2 sets

FIGURE 1 : STUDY SCHEDULE

No	ITEMS	YEAR AND MONTH																											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	Preparation and Field Reconnaissance	█																											
2	Review of Relevant Studies	█																											
3	Survey and mapping	█																											
4	Collection of data and information	█																											
5	Investigation and Study																												
6	Project Formulation																												
7	Project Analysis and Evaluation																												
8	Transfer of Knowledge																												
9	Reporting																												

Legend : █ : Continuous Service — : Periodical Service

ANNEX 1 :

RELEVANT URBAN DEVELOPMENT PROJECTS

No	Name of Project	Outline of investment scale	Period	Total capital (million USD)	Source of capital		Present Status
					Domestic	Sort	
1	Extension Part of Le Thanh Ton Street	3.5 km of grade 1 street connecting the city center with Saigon Bridge	1996 - 1997	20	Treasure Bonds	BOD	
		Infrastructure investment to 600 ha in Ward 22 Binhthanh District to construct a modern urban area	1996 - 2000	200			
2	North - South Highway Part 1	15 km long from Hiep Phuoc Industrial Zone to City Center. Street area 60m, 6 lanes, 4 additional lanes. Width of bridge : 22m, 4 lanes.	1996 - 1999	180	Budget and Treasure Bonds		
3	North - South Highway Part 2	12.45 km from Phu Dong square to An Suong intersection. Total length 5,840 km	1997 - 2000	227		BOT	
4	East - West Highway	20 km from Binh Chanh District to Binh Thanh District, Grade 1	1996 - 2000	400	Treasure Bonds	BOT	
5	Upgrading the Dien Bien Phu street from Dien Bien Phu - Dinh Tien Hoang Intersection to Saigon bridge	3.75 km, 8lanes and a technical infrastructure work : 2 in Van Thanh bridge and Dien Bien Phu Bridge	1996	210 billion VND	Budget and Treasure Bonds		
6	Upgrading the main axis of North West - South East	6 lanes, 16.5 km long, H30 bridge	1995 - 1999	34	Land Transference		
7	Upgrading Nguyen Tri Phuong St. to District 8, Nhac District.	6lanes, 5 km long, H30 bridge	1996 - 2000	250			
8	Flyer from Airport to city center	12.6 km	1995 - 2000	40	Budget	BOT	

RELEVANT URBAN DEVELOPMENT PROJECTS

No	Name of Project	Outline of investment scale	Period	Total capital :(million \$USD)		Source of capital		Present Status
				Domestic	Overseas	Domestic	Overseas	
9	Completing, upgrading Belt Highway	8 lanes, 52km long, H30 bridge	1995 - 2000	100			BOT	
10	One bridge and one tunnel through SaiGon River to Thua Thiem area	6 lanes, 1700m long, H30 bridge	1995 - 2000	236			BOT	
11	Motorway circling the Belt Highway (including a bridge over Nha Be River)	15km long, Bridge over Nha Be River is 45m high	1995 - 2000	150			BOT	
12	Belt Highway in the south of city (Binh Thuan Highway)	18km grade 1 street, 60m wide, street area 120m. Infrastructure works in 120ha	1996 - 2000	242		Land transference		
13	Bridge (or tunnel) from Nha Be to Cat Lai, Thu duc connecting to the Belt Highway	Bridge or tunnel over SaiGon River connecting Nha Be thu Duc and 5km Belt Highway	1997 - after 2000	250			BOT	
14	Trans. - Asia Route (part across Ho Chi Minh City)	43.6km long, Grade 1	1997 - 2000	90-100			ODA	
15	Upgrading the highway from Nha Be North to Hiep Phuoc (Interprovince Road 34)	6 lanes, 22km long, H30 bridge	1995 - 1999	45		Land transference		
16	Upgrading the main axis of Nha Be - Can Gio for the period before 2000 (with Dan Xay bridge)	4 lanes, 45km, H30, H13 bridge	1995 - 1998	30		T. Bond		
17	Binh Loi Bridge	530m bridge	1996 - 2000	233 (billion VND)		T. Bond		

RELEVANT URBAN DEVELOPMENT PROJECTS

No	Name of Project	Outline of investment scale	Period	Total capital (million \$US)	Source of capital		Present Status
					Domestic	Overseas	
18	Go Vap Cu Chi Interprovincial Road 15	4 lanes, 52km, H30 bridge	1995 - 2000	20	Land transference		
19	Upgrading the Highway 13 from city to Thu Dau Mot	40km	1995 - 1998	40		BOT	
20	Upgrading the main streets and existing sections	Widening vision range, signal light, 600km	1995 - 2000	500	Budget (250)	ODA (250)	
21	Metro way (phase 1)	12 km long, 2 routes, 60 unit per day	1998 - 2003			FDI - ODA	
22	Public Transportation in HO CHI MINH CITY	200 buses, 2 garages, 1 central station.	1995 - 1998	100		ODA	
23	Binh Quoi thanh Da Tourism Center (Infrastructure) works	Bridge over Sai Gon River connecting An Phu to the tourism area.	1997 - 2000	500		BOT	
24	New urban Center Thu Thiem	Phase 1: 800ha, Total area: 2,600ha	1997 - 2000	250	Land transference		
25	Linh Trung Industrial Zone	Tan Thuan: 300ha, Linh Trung: 60ha	1997 - 2000	90-19			
26	Phu Dinh Industrial Ports and Warehouse	200ha	1995 - 1998	50		FDI	
27	Hiep Phuoc Nha Be industrial Zone	Phase 1: 5000ha, Total area: 2000ha	1990 - 2000	50		FDI	
28	Binh Hoa - Binh Thanh Industrial Zone	50ha		10		FDI	

RELEVANT URBAN DEVELOPMENT PROJECTS

No	Name of Project	Outline of investment scale	Period	Total capital (million US\$)	Source of capital		Present Status
					Domestic	Overseas	
29	Cat Lai Industrial Zone	950ha, e phases	1990-2002	413	Land transference (228)	FDI(185)	
30	Thu Duc High Tech Industrial Zone	300ha, Total area: 200ha		200	Budget (4.1)	FDI (195.9)	
31	Industrial Zones in areas of districts	1,500	1994-1998	400	Land transference (150)	FDI(250)	
32	Infrastructure works in An Phu An Khanh	Phase 1: 400ha, Total area: 1000ha	1995-1997	700	Land transference (250)		
33	South Sai Gon City	2,600ha	1995-2000	800	Land transference		
34	34 Sports and Gym Complex HO CHI MINH CITY	450ha	1995-2005	350	Budget (0.5)	FDI (349.5)	
35	Cultural traditional Center	Phase 1: 30ha	1995-1997	100.8	Budget (2.8), T. Bond (1.4)		
36	Electrical distribution network, Phase 1: 1994 - 1997, phase 2: 1998-2004		1994-2004	346.5	Budget (130.1)	ODA (216.4)	
37	Support for solar energy program for the countryside of HO CHI MINH CITY		1995-1997	3		ODA	
38	Upgrading the lighting system of HO CHI MINH CITY	ALL HO CHI MINH CITY	1995-2000	33.8		ODA	

RELEVANT URBAN DEVELOPMENT PROJECTS(4/6)

No	Name of Project	Outline of investment scale	Period	Total capital (million USD)	Source of capital		Sort	Present Status
					Domestic	Overseas		
39	Sai Gon River Water supply	300,000 cu.m/full day	1997-2000	41.4		ADB	ODA	
40	Binh An Water Supply Plant	100,000 cu.m/full day	1994-1997	30		Malaysia	BOI	
41	Upgrading and expanding the Thu Duc Water Supply Plant	additional 100,000 cu.m/full day, Total capacity: 750,000 cu.m/full day	1995-2000		budget	ADB & Japan	ODA, FDI	
42	Upgrading Nhieu Loc - Thi Nghe Canal	11km, 3-5m wide		35		Canada	ODA	
43	Upgrading Thiam Luong - Ben Cat Canal	14km long, 16-100m wide		6.5			ODA	
44	Upgrading Tau Hu, Doi, Te Canals	9.5km		8			ODA	
45	Upgrading Tan Hoa - Lo Goin, Ong Buong canals	7.5km, 5-8mwide		5		Belgium	ODA	
46	Upgrading drainage system		1995-1997	5		ADB	ODA	
47	Building water treatment system for new area according to master plan	Nhi Xuan, An Khanh, An Phu, Thu Thiem, Binh Quoi, Thanh Da	1997-2005	95.7			ODA	

RELEVANT URBAN DEVELOPMENT PROJECTS(6/6)

No	Name of Project	Outline of investment scale	Period	Total capital (million USD)	Source of capital		Present Status
					Domestic	Overseas	
48	Treating the internal pollution situation of Binh Hung Hoa, South Nha Be, Hoc Mon, North Binh Chanh		1994	2		ODA	
49	Investing in garbage collector means	200 tones/day	1995-1998	150		Holland ODA	
50	Dredging the Soai Rap River	10 tones cu.m	1995-1998	160	Budget	FDI	
51	Building the solid waste treatment plant	1800T/d	1996-2000	65		India BOT	

(*) : Present status are categorized as follows

F/F: Fact Finding Stage

U/N: Under Negotiating with Donor country

M/S: Master Plan Study is on-going

F/S: Feasibility Study is on-going

D/D: Detailed Design is on-going

U/C: Under Construction

ANNEX 2 :

AMENDMENT OF THE MASTER PLAN ON URBAN REDEVELOPMENT FOR HO CHI MINH CITY UP TO THE YEAR 2020

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(IMPLEMENTING THE GUIDANCE OF THE PRIME MINISTER
N^o 30/TB DATED 28 MARCH 1996 OF THE GOVERNMENTAL OFFICE)

PART 1:

MAJOR ESTIMATIONS AND ORIENTATIONS FOR THE SOCIO- ECONOMIC DEVELOPMENT OF HO CHI MINH CITY UP TO 2010

BACKGROUND, LOCATION AND ROLE OF HOCHIMINH CITY

1. The 21st century which has been considered as a century for Asian - Pacific country will be in a very near future to some extent. The political setting of Vietnam and in the world has been changing rapidly, comprising advantages as well as difficulties and complications which has a significant impact to the Ho Chi Minh city. Therefore, when the determination of the orientation, socio-economic tasks and the establishment of the master plan on urban development for Ho Chi Minh city would be based on a wide vision knowledge of the whole Vietnam and other countries in the region.

For the Vietnam country, which has managed to escape from the socio-economic crisis and on the way to the new development period, proceeding the industrialization and modernization. The Vietnam's economy has gradually integrated to the world of which the Asian and the Asian-pacific countries as the first steps.

In the southern region of the country, the Mekong river Delta is a focal economic region of foods and foodstuffs, with its strategic significance and also the place where there have been a lot of development and economy improving to the modernization and industrialization, which has been gradually changing the style of this rural area. The west part of this southern region, particularly the provinces in the focal economic zone in the south, with its great potential has put its steps to the new development period with a "booming" characteristics. A number of industrial zones and urban areas planned to establish connecting to the city, creating a new vision of a dynamic economic development region in the southern part of Vietnam.

Right after the events that Vietnam become an official member of ASIAN and the relationship between Vietnam - US has been normalized, along with the many programs and international cooperation projects to develop the region of South East Asia, ASIAN

and the Mekong river sub-region concerning matters of trade, tourism, infrastructure, culture, scientific and technology, etc. The participation of Vietnam to these projects will help the city to widen its international cooperation.

Simultaneously, we must also compete with other countries with much higher technology in the South East Asia region, particularly with ASIAN countries and China. The process of integration into the regional and international economy, particularly with the Asian Free Trade Area (AFTA), World Trade Organization (WTO), Asian Pacific Economic Cooperation (APEC) has required us to adjust some activities related to the international standard practices.

In the process of implementing the renovation and open policy, those above mentioned factors will create new settings will advantages as well as disadvantages, prospective as well as challenges mixed together.

In the new conditions, the role and responsibilities of the city has been much emphasized to be a multifunctional centers in the southern area, *"along with Dongnai, Baria, Vungtau, Songbe for becoming a significant economic centers specialized in industry, trade, service, finance, monetary exchange, transportation of the whole country as well as of the south area of Indochina and South East Asia Region"* (Polite Bureau, dated 19, January 1996, about the Draft Report prepared for the Ho Chi Minh City Party Conference N^o VI)

POPULATION ESTIMATION

1. Based on the increase trends of population in the recent 5 years (3.18% annually in average), the Economic Institute of Ho Chi Minh City has estimated 3 population alternatives up to 2010 (see Table 1), of which the Alternative 2 has been chosen with the rate of 2.75 % per year (of which the natural rate is 1.09 % per year). Therefore, the population up to 2000 will reach 5.516 million, and in 2010 will be 7.23 million (rounded 7.5 million)
2. A part from the inhabitants in Ho Chi Minh City as above mentioned, there still be non-residents and immigrants from other provinces. It is estimated that the number in 1995 : 300,000 people, in 2010 : 1,500,000 people. Therefore in addition to the number of inhabitants in the Alternative 2, the actual number of population of Ho Chi Minh City in 2000 will be 6,016,994 people, in 2010 : 8,730,107 people.

LABOR SOURCE

With the increase on population, the labor force, quantitatively, will be sufficient and increased from 2.976 million labors in 1995 to 3.596 million in 2000 and 5.057 million in 2010. However the main issue of this is about the quality of labor force together with the way how to deal with coordination, distribution effectively.

To grant favorable conditions to the labor development, particularly the transportation to commute and exchange the forces between districts in the city area and between the city and industrial zones located in other provinces. It is estimated that the labors to commute between Ho Chi Minh City and other area will be increasing from 50,000 people in 1995 to about 80,000 - 100,000 people in 2000 and 250,000 - 300,000 people in 2010. As from the relation between supply and demand of labor force in areas, there will be part of labor force with high level of skill and knowledge to move to work in areas outside the city. In country, there will be a flow of labor force, mainly handicraft labors, will lower skill and knowledge will move find jobs and to work in the city.

OBJECTIVES AND ORIENTATIONS

1 . Objectives

- a. Together with maintaining the pace of high economic growth rate, the city should prepare for the prerequisites to assure the development being complete and stable in all sectors, considering the environment protection and social stability. In the years to come. it should be concentrated to the following difficulties. Imbalances :
 - ◆ The objective to develop the economy is set high despite the deficient, backward infrastructure
 - ◆ Population increase rate is high, population scale is very dense with the unreasonable distribution making the imbalance even greater and overloaded about the infrastructure
 - ◆ The labor force is very prosperous however the unemployment rate and unstable jobs are still very high with education levels is relatively low. There is still a shortage of skillful, specialized workers which hinders the labor recruitment in some sectors
 - ◆ The investment demand is very high though the capital power is very limited and the management skill is not very effective.

The scale of Ho Chi Minh City is very large containing many complicated matters and in the process of quick transformation, however the mechanism, and the policies are still not suitable and encouraged, the organization of management is still not capable in various aspects.

- b. The development of Ho Chi Minh City as a multi-functional centers should be connected and coordinated with that of other provinces belong to the focal economic zones in the south : Dongnai, Songbe, Baria-Vungtau to meet the development of the south of Vietnam, the southern part of the Middle Land and the Highlands.
- c. The development of Ho Chi Minh City should be considered along with the need to expand the market, the cooperation, relations with other countries in the region and in the world, ensuring at the same time the independence, self- reliance, security of the national economy, politics, defense, in the new situation. with its strategic location of which is very important politically, just after Hanoi, Ho Chi Minh City should improve its potential in various aspects, achieving a strong economy with high technology and

civilization, to become a economic, financial center, a modern urban area in the South east Asia.

2. Orientations

- a. To make use of the advantages and opportunities to speed up the economic growth, 15% in average in the period of 1996 - 2000, 14% in 2001 - 2010. The economic growth structure of Ho Chi Minh City throughout the period, from the structure of GDP, is Service - Industry - Agriculture. Of which :
- ♦ Service sector : accounted for about 54.7 % in 1995; 52.5% in 2000; and 54% in 2010
 - ♦ industrial and construction sector : 42.3%; 45.9%; and 45.3% respectively .
 - ♦ Agriculture, forestry and fishery sectors : logically decreasing from 0.9% in 1995 to 1.8% in 2000; and 0.7% in 2010.

However the most important issue is to create a synchronous transformation about efficiency, quality of the whole economy, particularly production sectors and key service sectors, to improve the competitive strength in the domestic market then expanding to other countries. *If should be concentrated in the development of industrial sectors which are with high technological application, complete the establishment of industrial zones, developing other industries of key importance : trade, import-export, finance, banking, insurance, tourism, transportation, telecommunication, scientific technology to meet the demand of the city and the area in the south; developing the agriculture sectors (including aquaculture and forestry) considering the environment protection; and should also be in harmony with the urban characteristics, taking the advantage of geographical location, technology skill and processing industry of the city, giving more attention to the urban development.* More attention should be paid for aqua-economy, constructing Cangio District an important logistic base for this development of the city and the southern area.

- l For the structure of economy, the ratio state sector will be keep of about 48% in 1995 to 42% in 2000 and 30% in 2010, however this sector will be subject to *a restructuring, to concentrate to sectors and areas of key importance, raising the efficiency, quality, ensuring the controlling role in the economy of the city.* The non-state sector will be with a relatively high, however will remain almost unchanged throughout the period : 42% in 1995, 43% in 2000, and 40% in 2010. *Of which the cooperative sector will be gradually increased from 1% in 1995 to 3% in and 8% in 2010.*

The development in the type of equitation (government capital to joint-venture with foreign investors and other domestic private investors). In 1995, the ratio of FDI sector in the economy, as shown by GDP figure, is 10%, though the joint-venture between the state enterprises and private sector is inconsiderably increased. It is estimated that, the ratio of the foreign investment sector will be increased 15% and domestic investment sector will be increased 5% in 2000. In 2010, the ratio of foreign investment sector and domestic investment sector will be kept increased, 30% and 10% respectively.

- c. To improve and modernize the socio-infrastructure, mainly the transportation would be considered as a key part to settle the current overload, backward situation and to create a essential condition for ensuring the steady development of the city to the 21st century.
- d. To implement strong measure to restrict the movement of population to the relocation of population, constructing new urban areas, industrial area in the suburban with modern infrastructure for receiving inhabitants from the inner city areas. To gradually improve, upgrade the current downtown area and invest to the new development central area of Thuthiem.
- e. To strengthen the economy with more attention to the living quality and social equality. To invest to the education sector, raising the knowledge, vocational training, the quality of labor force quality, developing the technology, concentrating to key sectors to meet with the demand of modernization and industrialization, creating more jobs, ensuring the social security, improving the living standard and morality, eradicating hunger, alleviating the poor-households and the difference between the poor and the rich from 10 times to 8 times in 2000 and 5-6 times in 2010, developing cultural environment.
- f. Economic development should be in connection with political security, social order, contributing activity to the defense security in the southern art of the country.

PART 2

MAIN CONTENTS FOR THE AMENDMENT OF MASTER PLAN ON URBAN REDEVELOPMENT FOR HO CHI MINH CITY

1. REQUIREMENTS

To re-arrange the urban population for gradually moving more inhabitants to the suburban areas (including outside the city) for lessening the pressure of the population in the urban areas that currently tends to concentrate more to the city centers. The new structure of the city should assure the criteria of non-concentration, multi-centers and should have favorable conditions to coordinate with urban clusters of the Southern Focal Economics Areas.

The solution for the Master Plan's Amendment to re-arrange the current urban areas (12 districts, 14,000 ha) should be considered together with the development of network of new urban centers in suburban areas (most of these new urban areas are adjacent to big industrial zone) and should also ensure the number of population moving from city urban areas and the new population in the areas in the 10 - 15 years to come.

On the basic of re-arrange population, urban areas, it is necessary to invest with greater consideration to the infrastructure investment (transportation, utility infrastructure) in

order to establish several new urban areas for receiving immigrants from the current 12 districts in the period of 1996 - 2000 and 2005.

The Master Plan's Amendment of improvement and development in the coming 10 - 15 years must ensure the light density in the current urban areas and specially in the new areas. There will be 6 - 7 new districts to be established. The surface area of greenery, parks will be increased creating more space and cleaning all canals in the current areas. The area of streets, public transportation stations should be widened. Public works areas should also be reserved (education, health care, entertainment, cultural houses, sports and gym areas, etc.) to ensure the standards and environment for the inhabitants of the urban population.

2 . AMENDMENT CONTENTS FOR HCMC'S MASTER PLAN

1 POPULATION MATTER AND ITS DISTRIBUTION

According to the guidance of the Prime minister, the population scale of Ho Chi Minh city (including urban and suburban areas) up to year of 2010 : 7.5 million inhabitants. Of which the distribution is estimated as follows :

1. The current urban areas (12 districts) should be restricted to not over 3 million (up to 2010). Therefore, inhabitants must be gradually moved off to the outside areas to new urban areas, and to re-settlement areas.
2. Generally, the new urban area (6 or 7 new districts) the population will be around 2.5 - 2.8 million.

Therefore the urban areas of the city (including the 12 current districts and 6 or 7 new districts) will be with population of 5.5 - 5.8 million inhabitants in the year of 2010.

The residential areas of Ho Chi Minh City outside the urban areas is estimated to distribute as follows :

1. The newly established urban areas in the outskirts of the city (connected to industrial zones which have been planned) the population is about 0.8 - 1.2 million inhabitants.
2. residential areas in the farming areas of Ho Chi Minh City is estimated to about 0.5 - 0.7 million inhabitants :

(Details about the re-arrangement of the population is shown in the attached from Table 1 to Table 4)

2. 2 THE CALCULATION OF LAND USE DEMAND

Calculation principles :

The calculation for this demand must be basic on the following principles :

- ♦ The correct direction of choosing land for redevelopment (from the current districts to the other areas)
- ♦ There must be estimation for the surface area reserved for the development of the urban areas of Ho Chi Minh City in the year of 2010 with a view to foresee about the period up to 2020.
- ♦ To determine the exact location and details about areas for forest of various kinds (isolated greenery, water surface, greenery carpet, and location of land areas reserved for construction of utility infrastructure works such as water treatment plant, power plant, power station, sewage treatment works, etc.)

Land using criteria and scale of surface area reserved for urban redevelopment
(Surface area - sq.m - per inhabitants in the urban areas)

a. *General criteria :*

- ♦ Current areas (12 districts) with 42 sq.m/inhabitant in average
- ♦ New areas with 110 sq.m per inhabitant in average

Based on this calculation, the demand of land for urban redevelopment (*in the old-inner city area, the new-inner city, towns areas with totally about 6.8 - 7.0 million inhabitants*), the reservation land should be more than 60,000 ha (600 sq.km). This surface area is excluded from the areas of forestry, greenery, water surface, isolation greenery areas, and various other technical infrastructure works located outside the inner city and other urbanization areas in the year of 2010

The land resource for the population increase to about 10 million in the year of 2020 should also be considered, of which the 9.5 million urban inhabitants will be demanding a land resource of about 87,500 ha (approx. 88,000 ha)

Totally, the land of current urban areas and for the development of Ho Chi Minh city up to the year of 2020 will be 88,000 ha, or about 100,000 ha (1,000 sq.km) including reservation (48 % of natural surface area in Ho Chi Minh City)

b. *Other important criteria*

Transportation land : Land use criteria for transportation in the urban areas is accounting for about 20 %, of which :

- ♦ Current area (12 districts) 15 - 16 %
- ♦ New area (6-7 districts) 20 - 30 %

Parks and greenery land : Surface areas of parks and greenery areas for the urban of 7. million inhabitants, in average :

- ♦ Current area (12 districts) 4 sq.m / inhabitant
- ♦ New area (6-7 districts) 15 sq.m / inhabitant

For other urban areas in the outskirts of the city, the criteria for land using about 10 % higher than that in the current area and new area as shown above.

2.3 MASTER PLAN AMENDMENT FOR THE UPGRADING AND IMPROVE - MENT OF CURRENT URBAN AREA (12 DISTRICTS OF OLD-INNER CITY)

Following are some important factors :

1. To concretely calculate to decrease the population scale in the current 12 districts from 3.692 millions (approved master plan of districts, 1995) to 3.0 millions in the year of 2010 (as mentioned in the attached Table 1)
2. To upgrade and improve the drainage and sewerage system, the environment, canal system that is currently causing heavy population in the inner city area.
3. To arrange and move the following objects :
 - ♦ Inhabitants living in low conditioned houses on and along canal and arroyos and also inhabitants in slum housing areas should be arranged and moved (to move 70%, and to re-locate 30%) to new urban areas in the city outskirts.
 - ♦ Polluted industrial factories : To gradually move polluted industrial factories, which have not ability to treat their polluted wastes. These units should be moved to the outskirts areas.

The re-arrangement should ensure the minimize of low-conditioned residential areas, the areas of industrial development and warehouses in order to maximize the land areas for the development demands of greenery, public works, transportation, cross sections, terminal stations, etc.

2.4 MASTER PLAN AMENDMENT FOR THE INDUSTRIAL DEVELOPMENT (Including the industrial zones and the vicinity residential areas)

Development directions

The setting of the architectural space to the main directions should be in accordance with the guidance which has been raised in the City's Master Plan approved Jan. 1993

- ♦ In the east : the east of Thuduc district linking to Nhontrach and Dongnai.
- ♦ In the south : Nhabe - Binhchanh (Saigon South) along Soairap river (towards Cangio)
- ♦ In the west : Anlac and Binhdien
- ♦ In the north : Hocmon and Cuchi Districts

(Two main directions are East and South)

Industrial re-organization

The organization of industrial zone (non-pollution) should be coordinated with the establishment of vicinity residential areas with the following objectives :

- ♦ To establish new medium-scale urban areas in the outskirts areas of the city
- ♦ To move the current urban inhabitants to these areas by ways of improvement of production, industries, employment and social activities.
- ♦ Along with other satellite urban complex (as the counterpoise of Ho Chi Minh City) of the focal economic zone in the south, to decrease the immigration of inhabitants from other provinces, lessen the population pressure in the city.

Up to 2000, a new urban area can be established (including industrial zones and vicinity residential areas) :

- ♦ Hiepphuoc Industrial Zone (2,000 ha) with the residential area in the north
- ♦ Catlai Industrial Zone (800 ha) with a residential area adjacent to the east of Thuduc District
- ♦ Lingtrung - Linhxuan Industrial Zone (450 ha) with Tanphu and Tambinh residential areas
- ♦ Tan Thoi Hiep Industrial Zone (400 ha) with the residential area in the east
- ♦ Tanquy Industrial Zone (300 ha) with a residential area in the north
- ♦ Industrial Zone in the north of Cuchi District (400 ha) with a residential area in the west
- ♦ Vinhloc A Industrial Zone (150 ha) with the residential area in the north of the Belt Highway (National Highway No 1)
- ♦ Tantaio Industrial Zone (200 ha) with Anlac residential area
- ♦ High-tech Industrial Zone in Thuduc District (800 ha) with a residential area in the south
- ♦ Leminhxuan - Binhchanh Industrial Zone (100 ha)

With the above planning :

- a) The area of industrial zones will be more than 5,000 ha, and land area for the new residential areas will be with the surface area according to the attached Table 5 (app. 6,000 hectares)
- b) Total inhabitants in the urban areas and towns, outskirts area will be about 1 million people

2. 5 AMENDMENT OF MASTER PLAN FOR THE INFRASTRUCTURE SYSTEM

UTILITY SYSTEM

The utility system of the urban areas will be calculated with the scale of about 8.5 - 9.5 millions people to take the initiative of urban development periods (not including rural areas). It should be focused more on urban transportation network, then the sewerage and drainage system, water supply system, environment hygiene and other systems.

Transportation

To establish a strategy for urban transportation focusing on developing the network of public transportation (the network and means of transportation, including trams, underground metro, and suspended cable cars)

To study solutions for urban transportation issue, to widen streets with prescribed street areas to increase the surface area of transportation, to pay more attention to the good organization of the public transportation.

According to the newly limited roads of the 588 main axis with the remainders are still be studied, the current urban road areas will be 14% of the total urban land areas (including road and parking areas - active and quiet transportation areas)

Bridge and road connecting Thuthiem area to the National Highway N0 51 Longthanh - Dongnai (connected to the Longthanh International Airport in future)

Bridge and road connecting Nhabe North - Binhchanh South Highway through Catlai to close outside Belt Highway (National Road N^o 1 - Korean Highway)

Binhloi bridge, the Inter Belt Highway will be connected to National Road N^o 1B, the Thuduc (in parallel with Hanoi Highway) and other west - east main axis.

North-south Axis (from Ansuong Intersection - Hocmon to Hiepphuoc - Nhabe)

Bridge and streets Nguyen Tri Phuong to be extended (from District 5 to the North Nhabe - South Binhchanh Highway)

To release bottleneck areas of Dien Bien Phu - Dinh Tien Hoang, Hungvuong - Phulam, Xo Viet Nghe Tinh street - Binhtrieu Bridge)

To study the simultaneous development of seaports of Vungtau and Thivai connecting with the current Saigon Port (as estimated by the Master Plan the throughput capacity of the Saigon and Nhabe Ports is about 15 million tones per year and its Hiepphuoc Port will be about 40 million tones per year).

Water supply

The following water supply projects should be considered to implement :

- ♦ To upgrade and improve the Thuduc Water Treatment Plant : The capacity of this plant will be increased to 1.4 million cubic meters per day by the year of 2010.
- ♦ To construct the Saigon River Water Treatment Plant with its capacity of 900,000 cu.m per day in 2010 (300,000 cu.m per day in the period of 1996-2000)
- ♦ To upgrade and construct the Hocmon and Binhchanh Underground Water Treatment Plants with the total capacity of 150,000 cu.m per day up to year of 2010 (The capacity of the Hocmon Plant will be increased to 100,000 cu.m per day and the capacity of Binhchanh Plant is of 50,000 cu.m per day)

- ♦ To construct the Binhuan water treatment plant with its capacity of 150,000 cu.m per day in 2010 (100,000 cu.m per day in the period of 1996 -2000)

According to this calculation, the city will have a quantity of 2.5 millions cu.m per day by the year 2010, to meet the water supply demand for the city with : 200-220 l/cap day for urban areas, 30 l/cap.day in average for rural areas and, 60-80 cu.m/ha.day for industrial zones.

Electricity supply and communication

Electricity supply

- ♦ As power source : The government already has large-scale investment plans to build power plants in the vicinity of the city, within the period from 1995 to beyond. The maximum exploitation the hydra and thermal power sources, and simultaneously, it is should be also attached to the power source from sunshine and wind energy.
- ♦ Planned quantity is about 23.9 billions KW.h (2,400 MW). Of which, 12 billions KW.h for industrial processing.
- ♦ Expanding and upgrading the change-voltage stations from national network.

Generally, all the stations and distribution grid system are to be reformed, replaced, built in accordance with the source.

Communication

The communication system will be developed with the newly and modernization way. Replacing the all current workstations by the electronic workstation system. Use the optical cable grid and the significant development of communication service network.

Environment hygiene

The environment hygiene should be considered along with the urban sewerage solution.

Environment hygiene

- ♦ The program of solving urban garbage
- ♦ The program of solving
- ♦ The program of re-arranging industrial factories and infectious hospitals in the inner city (internal pollution treatment and then move to outskirts area)

Cleaning up canals system

- ♦ To continue the program of Nhieuloc - Thinghe Canal (11km)
- ♦ To clean up the Tanhoa - Logom canal system (8 km)
- ♦ To clean up the Tauhu - Doi - Te canals (8 km)
- ♦ To clean up the Bennge canal system (3 km)

Treating industrial and domestic wastewater

- ✦ There must be a synchronous solution for developing this treatment network
- ✦ There must be at least three (3) sewage treatment plants (not including some internal and regional sewage treatment plants)

SOCIAL INFRASTRUCTURE

Amendment of social infrastructure networks should be based on new population distribution after the guidance of the Prime Minister. Special attention should be for criteria of public works services of inhabitants about health care, education, entertainment, sports and gym area and also the investment for a complete modern urban areas in the outskirts.

2. 6 PLANNING AND CONSTRUCTION THE OUTSKIRTS AREAS IN HO CHI MINH CITY

1. To concentrate on the program of industrial zones and the adjacent residential areas, considering this as an important objective. To determine the legal borders of these industrial zones, and the residential areas adjacent to these zones.
2. The program of complete electrification the countryside area in the outskirts.
3. The program of transportation in these outskirts areas
4. The program of communication
5. The program of creating social welfare basis, specially for organizing vocational centers. To consider the conversion of the labor structure for the development of urbanization.
6. The program of housing for these areas (about 170,000 houses with the surface areas of about 8,500,000 sqm. of construction area with 50 sq.m per household in average).
7. The program of creating greenery carpet, forestry area, water surface in harmonize with the outer landscapes, reservation and tourism areas. (Cangio: 32,000 ha, Cuchi: 750 ha, Thuduc: 800 ha, etc.)

2.7 IMPORTANT PROGRAMS FOR THE URBAN REDEVELOPMENT OF HCM CITY IN PERIOD OF 1996 - 2000

1. Infrastructure works
 - ✦ Transportation
 - ✦ Water supply and drainage
 - ✦ Improvement of the electrical distribution network
 - ✦ Development of the communication system

- ♦ Environment
- ♦ Housing and social welfare

2. industrial zones and adjacent residential areas (outskirts urban)

- ♦ Hiepphuoc (Nhabe)
- ♦ Catlai (Thuduc)
- ♦ Le Minh Xuan (Binhchanh)
- ♦ Tantaio (Bingchanh)
- ♦ Tan Thoi Hiep (Hocmon)
- ♦ Linhxuan (Thuduc)
- ♦ Cuchi District
- ♦ Tanquy (Cuchi)

3. Improving the current urban areas

- ♦ To specially focus on the improvement for cleaning canal system together with resettlement inhabitants in these areas in the newly established urban areas.
- ♦ To increase the transportation areas to avoid traffic congestion
- ♦ To increase the greenery area in the urban, specially in the 4 outer districts
- ♦ To complete and expand some parks that have been prepared such as :

* Damsen Park (District 11)	50.4 ha
* Kyhoa Park (District 10)	13.0 ha
* Binhtien Park (District 6)	11.0 ha
* Khanhhoi Park (District 6)	20.0 ha
* Vinhloc (Binhchanh)	400.0 ha
* Binhquoi - Thanhda (Binhthanh)	500.0 ha
* Rachchiec Sports and Gym Center (Thuduc)	300.0 ha
* Youth Center (Thuduc)	<u>200.0 ha</u>
Total	1,494.0 ha

- ♦ Drainage system, avoiding inundation in the inner city area

TABLE 1

PROPOSED POPULATION OF HO CHI MINH CITY

N ^o	DISTRICT	POPULATION (persons)		
		CURRENT SITUATION 1995	PLANNING FOR 2020	
			According to the approved Master Plan (Feb. 1995)	To be adjusted (according to the guidance of the Master Plan)
1	District 1	265,655	277,000	200,000
2	District 3	252,072	270,000	200,000
3	District 4	212,729	140,000	140,000
4	District 5	262,026	245,000	200,000
5	District 6	260,755	300,000	230,000
6	District 8	328,920	380,000	320,000
7	District 10	252,574	261,000	220,000
8	District 11	263,077	260,000	220,000
9	Phunhuan District	195,031	191,000	160,000
10	Tanbinh District	486,025	456,000	450,000
11	Binhthanh District	396,390	522,000	400,000
12	Govap District	223,110	300,000	260,000
12	inner Districts	3,362,364	3,692,000	3,000,000
13	Cuchi District	265,563	380,000	See Table 3 & 4
14	Hocmon District	320,280	450,000	"
15	Thuduc District	357,522	1,000,000	"
16	Binhchanh District	270,259	535,000	"
17	Nhabe District	160,484	400,000	"
18	Cangio District	58,698	534,400	"
6	suburban Districts	1,448,806	3,299,400	
	Total of Ho Chi Minh City	4,811,170	6,991,400	

TABLE 2 DEVELOPMENT DIRECTIONS OF URBAN AREAS IN HCMC

N ^o	DIRECTIONS OF DEVELOPMENT	AREA	SCALE (Ha)	REMARKS
1	East of the city	To all the Thuduc Dist.	1,400-1,500	3 new districts
2	North of the city	South of Hocmon Dist.	350 - 400	1 new district
3	West of the city	East of Binhchanh Dist.	250 - 300	1 new district
4	South of the city	Nhabe North - Binhchanh South	500 - 600	2 new districts

TABLE 3 DISTRIBUTION OF POPULATION IN NEW URBAN AREAS

N ^o	Name of new district	Land Area (ha)	Population (persons)		Receiving Ability (persons)
			Current 1995	The year of 2010	
1	District 2 (Thuduc)	5,020	86,027	500-600,000	400-500,000
2	Thuduc District	4,726	162,107	400-500,000	200-300,000
3	District 9 (Thuduc South Dis.)	11,375	123,059	450-500,000	300-350,000
4	District 7 (Tanmy Dis. Nhabe)	3,575	90,920	300-350,000	190-240,000
5	District 12 (Tanthanhan Dist.)	5,205	117,253	350-400,000	210-260,000
6	City West Dist. (Binhchanh)	3,029	80,808	200-300,000	100-200,000
7	City South District (Nhabe)	2,098	23,475	200-250,000	170-220,000
The development inner city		35,028	683,649	800-1,200,000	1,570-2,000,000

TABLE 4 DISTRIBUTION OF POPULATION IN NEW SUBURBAN AREAS

No	AREA	URBAN AREAS		Country Side Areas	TOTAL	
		Alternative 1	Alternative 2		Alternative 1	Alternative 2
1	Cubi District	200	170	200 - 280	480	370
2	Hocmon District	230	170	70 - 120	350	240
3	Binhchanh District	120	170	190 - 240	360	360
4	Nhabe District	120	190	20 - 30	200	210
5	Cangio District	80	500	20 - 30	110	520
Total :		800	1,200	500 - 700	1,500	1,700

TABLE 5

INDUSTRIAL ZONES

N ^o	INDUSTRIAL ZONES	AREAS SCALE (Ha)	LOCATION	LABOUR ESTIMATION (PERSONS)
1	Hiep Phuoc	2,000	Nhabe District	120,000
2	Phu My	400	Nhabe District	30,000
3	An Ha	90	Binhchanh District	10,000
4	Tantao - National Highway N ^o 1	500	Binhchanh District	55,000
5	Le Minh Xuan	100	Binhchanh District	11,000
6	Vinh Loc	150	Binhchanh District	16,500
7	Tan Phu Trung	500	Cuchi District	55,000
8	North west of Cuchi town	300	Cuchi District	30,000
9	Tan Quy	300	Cuchi District	33,000
10	Tan Thoi Hiep	400	Hocmon District	45,000
11	Cat Lai	800	Thuduc District	70,000
12	Thuduc North	400	Thuduc District	56,000
13	High-tech industrial zone	800	Thuduc District	80,000
Total		6,740		606,500

Notes :

- ♦ The criteria of labour force in the industrial zones : 100 - 120 labour per ha. This not included the number of labour outside the factories' fence .
- ♦ Number of labour is estimated : 670,000 - 800,000 persons.

(Unofficial translation)

MINISTRY OF PLANNING AND INVESTMENT

No.2361/BKH/KTDN

The Ministry of Planning and Investment of the Socialist Republic of Vietnam presents its compliments to the Embassy of Japan in Vietnam and has the honour to inform the latter of the followings:

Within the framework of the program of development cooperation between Vietnam and Japan, the Ministry of Planning and Investment has the honour to request the Government of Japan to consider a Official Development Assistance for the following priority projects as Development Survey :

Master Plan for National Development Telecommunications network.

The Ministry of Planning and Investment will send Term of Reference (TOR) and Application forms to Embassy of Japan later.

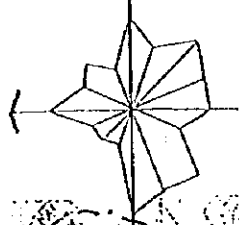
The Ministry of Planning and Investment of Vietnam avails itself of this opportunity to renew to the Embassy of Japan the assurance of its highest consideration.

Hanoi, 22 April, 1997
(Signed and sealed)

Võ Hồng Phúc
Vice Minister

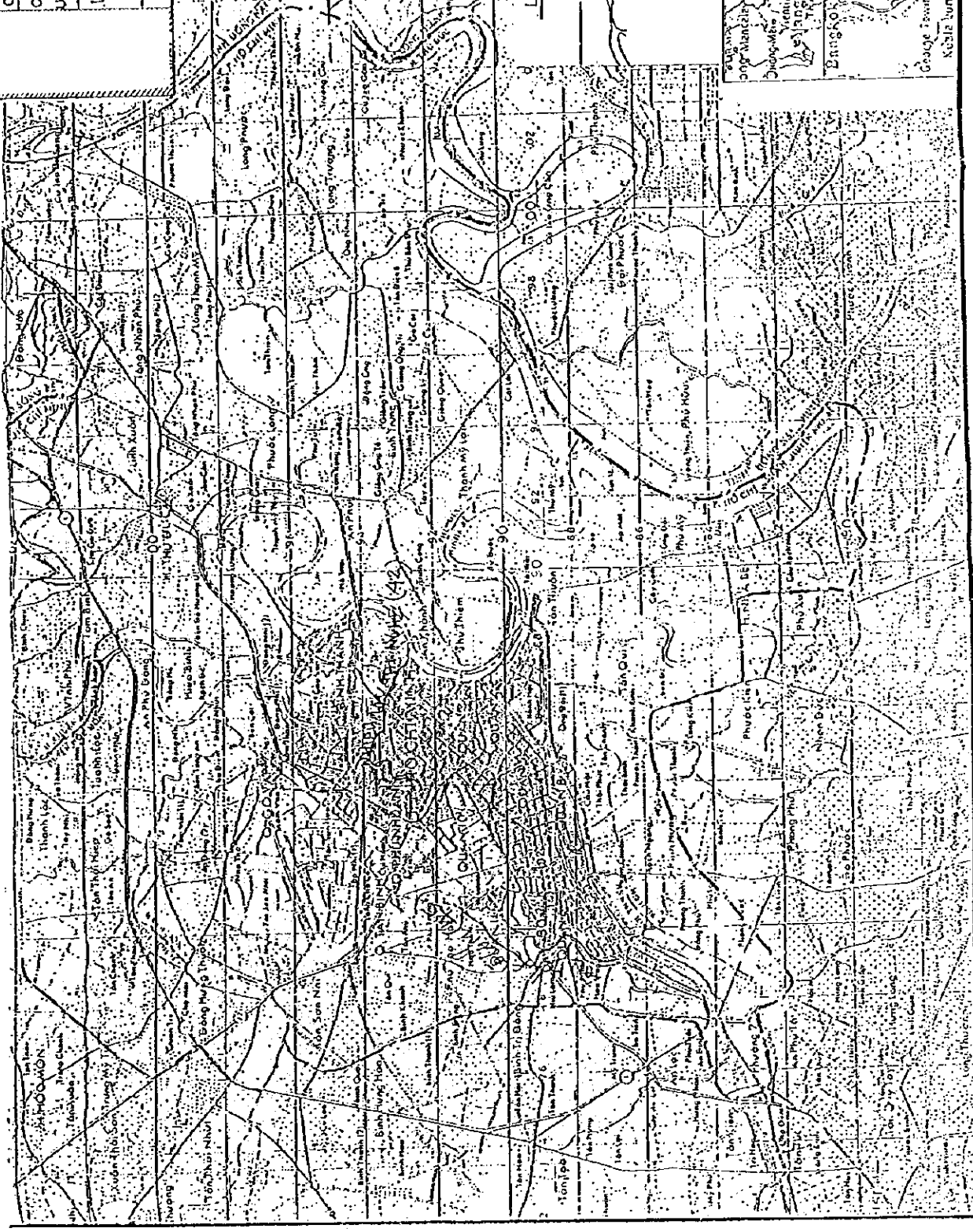
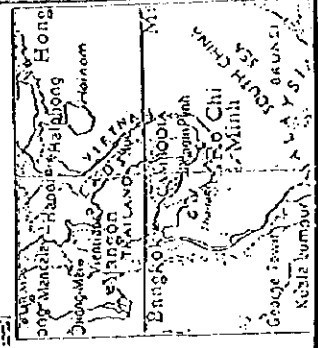
To: Embassy of Japan in Vietnam
c.c General Department for Port and Telecommunications

PEOPLE'S COMMITTEE
OF HO CHI MINH CITY
CITY MASTER ARCHITECT
URBAN PLANNING INSTITUTE
LOCATION MAP I
(STUDY AREA)
SCALE: 1/100,000

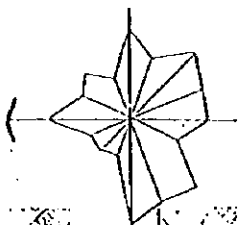


LEGEND

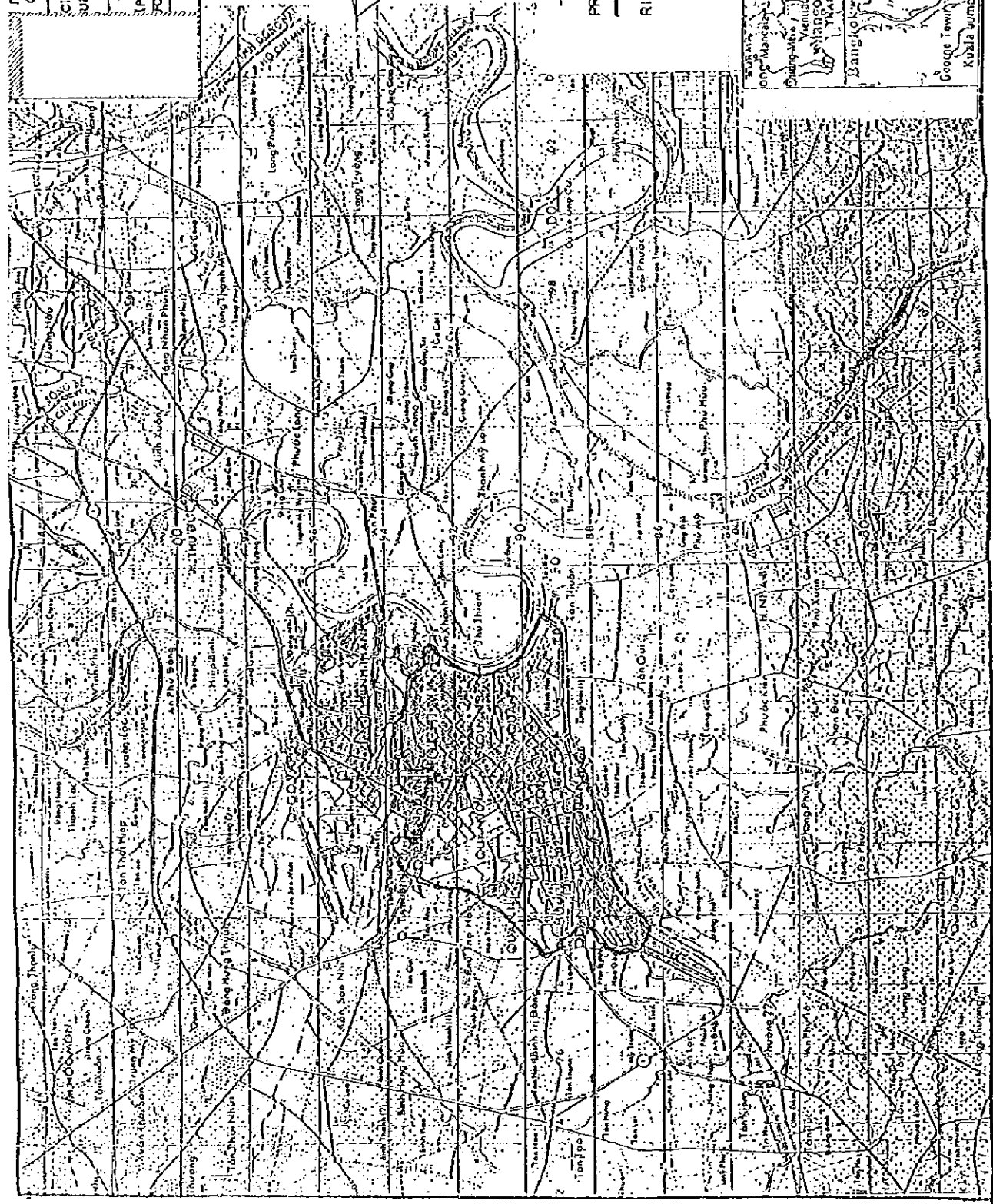
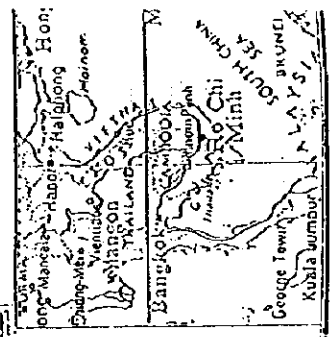
PROJECT BOUNDARY
RIVER AND CANAL



PEOPLE'S COMMITTEE
OF HO CHI MINH CITY
CITY MASTER ARCHITECT
URBAN PLANNING INSTITUTE
LOCATION MAP II
(PROJECT PROPOSED AREA
FOR JAPAN'S GRANT AID)
SCALE 1/100000



LEGEND
PROJECT BOUNDARY
RIVER AND CANAL




付属資料2 SCOPE OF WORK

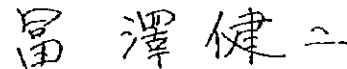
SCOPE OF WORK
FOR
THE STUDY
ON
URBAN DRAINAGE
AND
SEWERAGE SYSTEM
FOR
HO CHI MINH CITY
IN
THE SOCIALIST REPUBLIC OF VIET NAM

AGREED UPON BETWEEN
THE PEOPLE'S COMMITTEE OF HO CHI MINH CITY
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Ho Chi Minh City, January 19, 1998

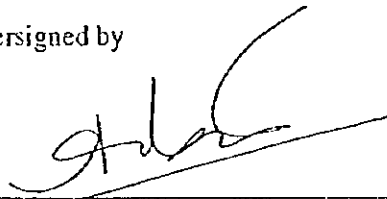


Mr. Vu Hung Viet
Vice chairman,
People's Committee of Ho Chi Minh City



Mr. Kenji Tomizawa
Leader of the Preparatory Study Team,
Japan International Cooperation
Agency (JICA)

countersigned by



Ms. Truong Thi Ngoc Lan
Deputy General Director of Infrastructure
Department,
Ministry of Planning and Investment

I. INTRODUCTION

In response to the request of the Government of the Socialist Republic of Viet Nam (hereinafter referred to as "the Government of Viet Nam"), the Government of Japan has decided to conduct The Study on Urban Drainage and Sewerage System for Ho Chi Minh City in the Socialist Republic of Viet Nam (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will undertake the Study, in close cooperation with the authorities concerned of the Socialist Republic of Viet Nam.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to formulate a master plan of urban drainage and sewerage system including phasing implementation program(s) for Ho Chi Minh City
2. to conduct a feasibility study on urban drainage and/or sewerage system for the priority project identified in the master plan study
3. to transfer technology to the counterpart personnel in the course of the Study.

III. STUDY AREA

The study area shall cover the urban area (approximately 140km²), and its surrounding area (approximately 510km²).

The study area is shown in the appendix 1.

IV. SCOPE OF THE STUDY

Phase I: Formulation of the Master Plan

[Basic Study]

1. Collection and review of related data and information
 - (1) natural conditions, including meteorological, hydrological and geological data, and topographic map
 - (2) social and economic conditions
 - (3) national, regional and urban development plans
 - (4) laws, regulations, policies and customary practices relevant to the Study
 - (5) existing drainage, sewerage and water supply facilities
 - (6) present institutions, organizations, administration and their function relevant to the Study
 - (7) social and economic infrastructures relevant to the Study
 - (8) land use
 - (9) solid and liquid waste

- (10) on-going / planned projects and plans relevant to the Study
 - (11) other relevant data and information
2. Review of studies and plans relevant to the Study
 3. Field reconnaissance and Field survey, if necessary
 - (1) hydrological, topographical and geological conditions
 - (2) existing drainage and sewerage facilities
 - (3) water quality
 - (4) land use
 - (5) inundation condition and damages
 - (6) present environmental conditions
 4. Analysis and examination of the result of basic study

[Formulation of a Master Plan]

1. hydraulic and hydrological study
2. Confirmation of planning framework
 - (1) socio-economic framework, including planned population
 - (2) design storm water flow
 - (3) design waste water quality and quantity
 - (4) planning area
 - (5) drainage collecting system
 - (6) waste water collecting system
 - (7) waste water treatment system
3. Establishment of alternatives and selection of the optimum plans
4. Formulation of a Master Plan
 - (1) Preliminary design of facility(ies)
 - (2) Non-structural measure(s)
 - (3) Operation and maintenance plan
 - (4) Institutional development plan
 - (5) Cost estimation and financial plan
5. Initial environmental examination (IEE)
6. Evaluation of the master plan
 - (1) economic evaluation
 - (2) social evaluation
 - (3) technical evaluation
 - (4) financial evaluation
7. Formulation of phasing implementation program(s)
8. Selection of priority project(s)

Phase II: Feasibility Study on the Priority project(s)

1. Supplemental data collection and analysis
2. Supplemental field survey
3. Confirmation of planning framework
4. Formulation of plans for the priority project(s)
 - (1) design of facility(ies)
 - (2) non-structural measure(s)
 - (3) operation and maintenance plan
 - (4) institutional development plan
 - (5) cost estimation and financial plan
5. Environmental impact assessment (EIA)
6. Project evaluation
 - (1) economic evaluation
 - (2) social evaluation
 - (3) technical evaluation
 - (4) financial evaluation
7. Formulation of implementation plan
8. Recommendation

V. STUDY SCHEDULE

The study will be conducted in accordance with the tentative schedule as attached in the Appendix 2. The schedule is tentative and subject to be modified when both parties agree upon any necessity that arise during the course of the Study.

VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Viet Nam.

1. Inception Report:

Fifty (50) copies at the commencement of the first field survey in Viet Nam. This report will contain the schedule and methodology of the Study as well as outline of the field survey.

2. Progress Report (1):

Fifty (50) copies at the end of the first field survey.



3. Interim Report:

Fifty (50) copies at the end of Phase I. This report will contain the results of the Phase I survey and outline of the Phase II study program.

4. Progress Report (2):

Fifty (50) copies at the end of the second field survey.

5. Draft Final Report:

Fifty (50) copies at the end of the third field survey. The Government of Viet Nam shall submit its comments within one (1) month after the receipt of the Draft Final Report.

6. Final Report:

Fifty (50) copies within one (1) month after the receipt of the comments on the Draft Final Report.

VII. UNDERTAKINGS OF THE GOVERNMENT OF VIET NAM

1. To facilitate the smooth conduct of the Study, the Government of Viet Nam will take the following necessary measures:
 - (1) To secure the safety of the Japanese study team (hereinafter referred to as "the Team")
 - (2) To permit the members of the Team to enter, leave and sojourn in Viet Nam for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees
 - (3) To exempt the members of the Team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into Viet Nam for the conduct of the Study
 - (4) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study
 - (5) To provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into Viet Nam from Japan in connection with the implementation of the Study
 - (6) To secure permission for the Team to enter into private properties or restricted areas for the implementation of the Study
 - (7) To secure permission for the Team to take all data and documents (including photographs and maps) related to the Study out of Viet Nam to Japan
 - (8) To provide medical services as needed, expenses for which will be chargeable to the members of the Team.

(5)
(12)

dy

dy

2. The Government of Viet Nam shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Team.
3. People's Committee of Ho Chi Minh City (hereinafter referred to as "the PCHCM") shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations for the smooth implementation of the Study. The PCHCM shall, at its own expense, provide the Team with the followings, in cooperation with other organizations concerned:
 - (1) available data and information relevant to the Study
 - (2) counterpart personnel
 - (3) suitable office space with necessary equipment in Ho Chi Minh City
 - (4) credentials or identification cards
 - (5) an appropriate number of vehicles with drivers.

VIII. UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, study teams to Viet Nam
2. to pursue technology transfer to the counterpart personnel in the course of the Study.

IX. CONSULTATION

JICA and the PCHCM shall consult with each other in respect of any matter that may arise from or in connection with the Study.

