

## 第8章 経済・財務分析

### 8.1 経済評価

各分野で提案された短中期復旧・復興プログラムについて、経済分析を実施した。

#### 8.1.1 道路交通分野

道路交通分野の便益を計算するにあたり、下記のようなプロセスで経済評価を実施する。

- Step 1: プロジェクトが実施される場合(With)と実施されない場合(Without)の交通需要予測をする。
- Step 2: 交通需要予測と VOC を基に便益を計算する。
- Step 3: 財務コストから経済コストへ変換する。
- Step 4: 便益と経済価格を用いて経済評価指標を示す。
- Step 5: 感度分析を実施する。

表 8-1 車両運転コスト

車種	走行 (米ドル/1000km)	メンテナンス (米ドル/時間)	時間 (米ドル/時間)
乗用車	108	0.32	1.58
タクシー	130	0.84	0.31
ミニバス	291	0.96	0.81
大型バス	527	1.19	2.16
トラック	376	1.52	0.00
二輪車	29	0.04	0.26

出所：JICA 調査団

#### 8.1.2 上水道分野

上水道プロジェクトにおける経済評価は、プロジェクトの性格により定量的に計れる場合と定量化が計れない場合とに分類される。本調査における経済評価は以下のような便益を定量化した。

- 現在供給を受けている(共同水栓や水の購入を含む)生活水の実質支払金額(without)とプロジェクト(村落給水型地下水)が完成された時に支払うであろう金額(社会調査で得られた支払意志額)(with)の差額を便益と想定した。
- 水汲みに要する時間(社会調査の結果、1世帯1日30分)コストの節約
- 世界銀行の調査において、時間削減の内、経済的活動に費やされるのは51.5%(就寝時間以外の生活時間に占める割合)と想定し、コストを計算した。

定量的に計れない便益として、安全な水の供給を受けることにより生活が安定し、環境面、衛生面での改善が考えられる。

#### 8.1.3 下水・衛生分野

この分野の便益を定量的に計るのは非常に難しいが、本調査では下水道プロジェクトの完成後、都市の生活環境の向上並びに河川等の水質改善の結果、想定できる便益を定量的に算出した。

そこで社会的な大きなインパクトの一つとして、水因性の病気の減少による医療費の削減を定量的に算出した。社会調査の結果、世帯毎の医療費の内、水因性と想定されるのは世帯収入の46%という結果が出された。この水因性の医療費に加え、病院へ通う時間費用も節約され、便益に加算されるが、その算定根拠が乏しく、本調査では医療費の削減を便益として計算した。

## 8.2 財務評価

本調査を基に現地政府から無償資金協力で要請されている「ペインズビル地区給水事業プロジェクト」について財務的に実現可能性があるか否かを計算した。当該プロジェクトは、無償資金を想定した村落給水事業であるため、初期投資額を 0 とし、その収入が維持管理費用を持続的に賄えるかを検証した。その結果を下表に示した。

表 8-2 財務評価

B/C	FIRR (%)	NPV (千米ドル)
1.21	56.57	1,421

初期投資に係る政府負担がないため、FIRR は高い数値を示している。

また毎年の O&M 費用を考慮すると年間収入でその費用を賄うことは可能という結果になっているが、発電機や揚水ポンプの定期的な取り換えについては、自国の資金で調達しなければならず、安定した収入が不可欠である。安定した収入が得られない場合は、一般会計(国の税金)や市からの補助金に頼ることになる可能性もある。しかしながら持続的に給水事業が実施されるためには、水使用住民が足りない部分を出し合うシステムも考えなければならない。

## 第9章 総合都市施設復旧・復興マスタープラン

### 9.1 総合都市施設復旧・復興マスタープランの戦略

#### 9.1.1 マスタープラン作成の方針

対象とする分野の特性や深刻性に依りて分野横断的な検討を施し、総合都市施設復旧・復興マスタープランの作成を行うために本調査が開始された。マスタープランの作成にあたっては特に以下の諸点に留意している。

表 9-1 分野別の復旧・復興計画の内容

		09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
都市施設マスタープラン	道路分野 復旧 復興	●															
	上水道分野 復旧 復興	●															
	下水道分野 短期復旧 中期復旧	●															
	雨水排水分野 復旧	●															
	その他都市施設分野 土地利用計画	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

注: 表内には「インフラの修繕・リハビリ」や「機能復元または機能強化を前提とした復興」などの計画内容が記載されている。また、2020年以降の計画は「将来都市像」の範囲に属する。表下部には「M/P見直し開発戦略による都市機能の確定と強化」および「施設規模拡大・都市骨格形成」の注釈がある。

本件調査での対象分野・検討分野

- ① 必要整備量としての復旧復興計画
- ② 復旧・復興ニーズのパッケージ化
- ③ コミュニティーレベルのインフラ整備プロジェクト
- ④ 市街化調整区域の住民対策
- ⑤ 整備時期の調整（雨水排水整備と道路整備、上水道整備と下水道・衛生施設整備等）

コミュニティの生活水準の復旧及び復興のために分野横断的なプロジェクト形成を考え、コミュニティインフラ整備プロジェクトとして独立させている。すなわち、生活道路の建設と維持管理、コミュニティ共同井戸の開発と管理、下水処理、雨水排水の処理等を分野横断的なプロジェクトとして形成する。このプロジェクトについてはNGOの協力、コミュニティ自助努力によるプロジェクトの実施を考える。近年、国際援助機関の間でこのようなコミュニティによる開発の重要性が認識されており、TICAD\*をはじめとする新たな支援枠組みが提案されている。

\*TICAD: Tokyo International Conference on African Development  
 1993年以降、日本政府が主導し、国連、国連開発計画（UNDP）及び世界銀行等と共同でアフリカの開発をテーマとして開催している国際会議

#### 9.1.2 本マスタープランと PRS との関係

本マスタープランではPRSで想定されている4つのPillarのうちSecurityを除いた3つのPillarに対応した将来ビジョンを示しており、環境社会配慮を追加している。プロジェクトの経済分析においては環境社会面での外部経済、不経済を扱っているが、本調査ではさらに積極的に環境社会面でのプロジェクトについて配慮している。その理由は計画期間がより長期にわたるため、復旧から復興へと計画内容に展開を求められること、その場合、外部経済効果を考えたプロジェクトを視野に入れることが不可欠のものと考えたためである（本調査での範疇外となるが例えば海岸線の浸蝕防止プロジェクトや湿地帯の保全プロジェクト等が環境分野でのプロジェクト例としてあげられる）。MDGsについては発展的に継承している。

### 9.1.3 マスタープランの地域別将来ビジョンと目標

表9-2 インフラ整備の観点からの地域別の将来ビジョン（2019年）

		インフラ整備の観点からの地域別の将来ビジョン（2019年）	
		旧市街地*	新興市街地
貧困削減の課題	基礎的生活ニーズの充足	<ul style="list-style-type: none"> <li>○旧市街地地区での居住水準向上（市街地化されたインフォーマル住宅地含む）</li> <li>・居住の高密度化に対応したインフラ整備</li> <li>・道路の維持管理システムの確立</li> <li>・安全な水供給と維持管理システムの確立</li> <li>・下水施設復旧による下水処理区域の拡大と維持管理システムの確立</li> <li>・雨水排水施設の復旧（・電力供給）</li> </ul>	<ul style="list-style-type: none"> <li>○既存コミュニティの生活改善</li> <li>・居住の高密度化に対応したインフラ整備</li> <li>・コミュニティ道路の通年の確保（学校、医療施設等へのアクセス確保）</li> <li>・安価な公共交通の提供</li> <li>・安全な水供給と維持管理システムの確立</li> <li>・ワザト衛生システムの拡充（・学校教育施設の整備）（・電力供給）</li> </ul>
		整備目標 ・人口密度（227人/ha） ・道路整備率 補助幹線道路：100% 区画街路：100% ・給水世帯率：100% ・衛生施設普及率：約64%	整備目標 ・人口密度（84人/ha） ・道路整備率 補助幹線道路：100% 区画街路：100% ・給水世帯率：100% ・衛生施設普及率：約70%
	経済の復興	<ul style="list-style-type: none"> <li>○都心部の機能復元</li> <li>・交通情報幹線の復元（ポートアクセス、都心アクセス、市街地道路等）</li> <li>・交通渋滞対策（・不法占拠民対策）（・電力供給）</li> </ul>	<ul style="list-style-type: none"> <li>○産業機能の計画的復興</li> <li>・交通情報幹線の復元（ポートアクセス、都心アクセス、市街地道路等）</li> <li>・交通渋滞対策（・工業団地の再生）（・電力供給）</li> </ul>
		整備目標 ・道路整備率 幹線道路：100%	整備目標 ・道路整備率 幹線道路：100%
行政能力向上	首都行政機能の回復	自助的コミュニティパワー形成	
環境配慮社会	<ul style="list-style-type: none"> <li>○湿地帯の復元（本来的土地利用への復元）</li> <li>・代替地の提供（○海岸の護岸対策）</li> </ul>	<ul style="list-style-type: none"> <li>○湿地帯の復元（本来的土地利用への復元）</li> <li>・代替地の提供（○海岸の護岸対策）</li> </ul>	
	整備目標 ・インフォーマルセトルメントでの人口増加抑制		
プロジェクト実施	雇用の創出への配慮		

\*旧市街地：New Kru Town, Logan Town, Clala Town, West Point, Central Monrovia A, Central Monrovia B, Sinkor, Lakpazee, Old Road, and Congo Town

## 9.2 マスタープランの策定（短期及び中期）

### 9.2.1 プロジェクトコストと利用可能資金

本調査で対象とする都市施設分野で提案されたプロジェクトの概略コストを以下に示す。各年の必要資金額の算定ではプロジェクトコストをプロジェクト期間で除すことにより概算値を算定している。

年間のMPW予算はおおよそ16-20百万米ドルの水準であり、そのうち資本形成に係わる予算は12百万米ドルの規模である。ただしMPWの予算規模はモンロビア都市圏のみでなく全リベリアを対象としていることに留意すべきである。一方、関係機関による「リ」国に対する2008年の本調査で対象とする含まれる4分野の支援額はおおよそ同程度の規模であった。

本調査でのマスタープラン・プログラムの年間の最大投資規模は60百万米ドルに達するものの、対価の期待できる給水及び下水分野のプロジェクトコストを差し引くと約30百万米ドルとなり、平均の必要資金量は約10百万米ドルとなる。本調査では前途(9.1参照)した目標値を達成するための必要量としてのプロジェクト形成を行っているところから、MPW予算との乖離はあるものの基本的に各分野で提案されたプロジェクトをマスタープランに統合しプログラムとしてまとめている。

初期の復旧段階を過ぎた後にも国際支援機関から継続的に同程度の支援が得られる保証はなく、また近い将来に有償のプロジェクトが実施し得るような状況が到来する可能性も高くはない。今後は二国間援助スキームの重要性が一層増大してくるよう予想され、そのための対応が「リ」国として必要となると思われる。

表 9-3 提案プロジェクトの概略コスト

(Unit: mln USD)

Sector/Projects	Total Cost	Year											
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
<b>道路交通セクター</b>													
TR-0 Emergency Infrastructure Project (MPW, LRTF, on-going)	18.60	6.20	6.20	6.20									
TR-1 Johnson Street Bridge Improvement Project (Undecided)	24.00			3.60	3.60	8.40							
TR-2 Somalia Drive Reconstruction Project (Undecided)	21.10		5.28	5.28	10.55								
TR-3 Reconstruction of Bridges on Missing Link (Undecided)	10.64		2.66	2.66	5.32								
TR-4 Road Rehabilitation Project (Undecided)	48.28				4.83	4.83	4.83	6.76	6.76	6.76	6.76	6.76	
TR-5 Intersection Improvement Project (Undecided)	5.30				0.44	0.44	0.44	0.80	0.80	0.80	0.80	0.80	
TR-6 Bus Terminal & Bus Stop Facilities Construction Project (Undecided)	6.80		0.34	0.34	0.34	0.34	0.34	1.02	1.02	1.02	1.02	1.02	
TR-7 Traffic Safe Management Project (Undecided)	2.00						0.20	0.60	0.60	0.60			
TR-8 Vai Town Bridge Reconstruction (WB, Grant, on-going)	15.00	5.00	5.00	5.00									
TR-9 Rehabilitation of Monrovia City Streets Project (WB, Grant, on-going)	17.60	5.87	5.87	5.87									
TR-10 Caldwell Bridge Construction Project (WB, Grant, on-going)	7.00		3.15	3.15	0.70								
Cotton Tree - Buchanan Corridor Project (WB)	45.00		9.00	9.00	9.00	9.00	9.00						
Monrovia - Ganta/Guinea Border Corridor Project (WB)	100.00		20.00	20.00	20.00	20.00	20.00						
Performance-based Road Contract for Rehabilitation of specified Monrovia City Streets (WB)	17.00	7.08	8.50	1.42									
Rehabilitation and Maintenance of the Monrovia-Ganta and Airport-Buchanan road (WB)	60.00		12.00	12.00	12.00	12.00	12.00						
Feeder Road in Bong, Lofa and Nimba Counties (WB)	6.27	0.63	1.25	1.25	1.25	1.25	0.63						
Rehabilitation of the Suakoko-Kaffee-Yaendewoun Road (Ongoing)	0.11	0.05	0.05										
Rehabilitation of the Sanielle-Ganta Road (Ongoing)	0.04	0.02	0.02										
<b>本M/Pで提案されたプロジェクトのコスト</b>	<b>118.12</b>	<b>0.00</b>	<b>11.88</b>	<b>11.88</b>	<b>29.88</b>	<b>14.01</b>	<b>5.81</b>	<b>9.17</b>	<b>9.17</b>	<b>9.17</b>	<b>9.17</b>	<b>8.57</b>	<b>8.57</b>
<b>道路交通セクタープロジェクトコスト</b>	<b>404.73</b>	<b>24.85</b>	<b>82.92</b>	<b>75.76</b>	<b>72.83</b>	<b>56.26</b>	<b>47.44</b>	<b>9.17</b>	<b>9.17</b>	<b>9.17</b>	<b>9.17</b>	<b>8.57</b>	<b>8.57</b>
<b>上水道セクター</b>													
WS-1 Monrovia Water and Sanitation Rehabilitation Program (Ongoing)	38.50	4.75	9.75	24.00									
WS-2 Monrovia Expansion and Rehabilitation of Three County Capitals Project for Emergency Development of Water Supply System at Paynesville in Greater Monrovia (PEDW)	19.24	3.00	8.12	8.12									
WS-3 Expansion Project of White Plains Water Supply System (EPWS)	128.63		2.50	7.10	7.00								
Expansion of Treatment Plant Phase I	15.93					17.09	17.09	25.17	22.66	22.67	15.87	8.08	
Expansion of Treatment Plant Phase II	23.34					5.30	5.30	5.33					
Expansion of Rising Main Line	33.96						6.79	6.79	6.79	7.78	7.78	7.78	
Expansion of Distribution Main Line	40.44						6.79	6.79	6.79	6.80	6.80	6.80	
Service Reservoir Installation	14.96						8.09	8.09	8.09	8.09	8.09	8.08	
WS-4 Project for Expansion of Water Supply System at Paynesville in Greater Monrovia (PEWS) Phase II (Undecided)	22.87				2.07	6.76	4.68	4.68	4.68				
WS-5 Technical Cooperation Project of Groundwater Management (Undecided)	0.32				0.10	0.11	0.11						
WS-6 Technical Cooperation Project of Non-Revenue Water (Undecided)	1.50				0.50	0.50	0.50						
Capacity Building for LWSC (Ongoing)	5.00	1.67	1.67	1.67									
Assistance on Program Management (Ongoing)	7.00	2.33	2.33	2.33									
Assistance on Sector Reform (Ongoing)	2.00	0.67	0.67	0.67									
<b>本M/Pで提案されたプロジェクト</b>	<b>169.92</b>	<b>0.00</b>	<b>2.50</b>	<b>7.10</b>	<b>9.67</b>	<b>24.46</b>	<b>22.38</b>	<b>29.85</b>	<b>27.34</b>	<b>22.67</b>	<b>15.87</b>	<b>8.08</b>	
<b>上水道セクタープロジェクトコスト</b>	<b>241.66</b>	<b>12.42</b>	<b>25.04</b>	<b>43.89</b>	<b>9.67</b>	<b>24.46</b>	<b>22.38</b>	<b>29.85</b>	<b>27.34</b>	<b>22.67</b>	<b>15.87</b>	<b>8.08</b>	
<b>下水・衛生セクター</b>													
SN-1 Monrovia Water and Sanitation Rehabilitation Program	15.00	5.00	5.00	5.00									
SN-2 Urban Infrastructure Construction and Rehabilitation of Monrovia Sewerage Network Pumping Stations (WB, ongoing)	4.80	0.80	2.00	2.00									
SN-3 Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement Plan for 2014 (Undecided)	18.11			4.53	4.53	4.53	4.53						
SN-4 Project for Reconstruction of Sewerage Treatment & Sludge Treatment Plant (Undecided)	74.20							14.84	14.84	14.84	14.84	14.84	
SN-5 Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement Plan for 2019 (Undecided)	23.38							4.68	4.68	4.68	4.68	4.68	
<b>本M/Pで提案されたプロジェクト</b>	<b>115.69</b>	<b>0.00</b>	<b>0.00</b>	<b>4.53</b>	<b>4.53</b>	<b>4.53</b>	<b>4.53</b>	<b>19.52</b>	<b>19.52</b>	<b>19.52</b>	<b>19.52</b>	<b>19.52</b>	
<b>下水・衛生セクタープロジェクトコスト</b>	<b>135.49</b>	<b>5.80</b>	<b>7.00</b>	<b>11.53</b>	<b>4.53</b>	<b>4.53</b>	<b>4.53</b>	<b>19.52</b>	<b>19.52</b>	<b>19.52</b>	<b>19.52</b>	<b>19.52</b>	
<b>雨水排水セクター</b>													
SW-1 Special Project Monrovia (Ongoing)	0.20	0.20											
SW-2 Improvement of Drainage System in Monrovia Core Area (Undecided)	12.26			1.14	4.26	4.72	2.13						
Drainage System Improvement (Central Monrovia)	1.62			0.54	1.08								
Drainage System Improvement (Sinkrod)	3.97				1.98	1.98							
Drainage System Improvement (Bushrod Island) (Admin, ES, Contingency, etc.)	3.07				1.53	1.53							
SW-2 Equipment Supply for Drainage Pipes Cleaning (Undecided)	3.60			0.60	1.20	1.20	0.60						
Procurement of Equipment (Admin, ES, Contingency, etc.)	1.33			0.67	0.67								
SW-3 Technical Cooperation Programme (Undecided)	0.93			0.47	0.47								
	0.40			0.20	0.20								
	0.28			0.14	0.14								
<b>本M/Pで提案されたプロジェクト</b>	<b>13.86</b>	<b>0.00</b>	<b>0.00</b>	<b>1.94</b>	<b>5.07</b>	<b>4.72</b>	<b>2.13</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>雨水排水セクタープロジェクトコスト</b>	<b>14.07</b>	<b>0.20</b>	<b>0.00</b>	<b>1.94</b>	<b>5.07</b>	<b>4.72</b>	<b>2.13</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>コミュニティインフラ改善</b>													
CM-1 Community Infrastructure Improvement Project (Undecided)	27.79				3.20	4.16	3.73	3.92	3.92	2.96	2.96	2.96	
Road Rehabilitation	16.09				1.61	1.61	1.61	2.25	2.25	2.25	2.25	2.25	
Water Supply	4.69				0.43	1.38	0.96	0.96	0.96				
Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement	7.01				1.16	1.16	1.16	0.70	0.70	0.70	0.70	0.70	
<b>本M/Pで提案されたプロジェクト</b>	<b>445.38</b>	<b>0.00</b>	<b>14.38</b>	<b>25.45</b>	<b>52.35</b>	<b>51.87</b>	<b>38.58</b>	<b>62.46</b>	<b>59.95</b>	<b>54.32</b>	<b>46.92</b>	<b>39.13</b>	
<b>全セクタープロジェクトコスト合計</b>	<b>823.74</b>	<b>43.27</b>	<b>114.96</b>	<b>133.12</b>	<b>95.30</b>	<b>94.12</b>	<b>80.21</b>	<b>62.46</b>	<b>59.95</b>	<b>54.32</b>	<b>46.92</b>	<b>39.13</b>	

9.2.2 マスタープラン・プログラム（短期及び中期）

プログラムの作成にあたっては以下の評価軸でプロジェクトを評価し、整備時期の検討を行った。

- |                 |                             |
|-----------------|-----------------------------|
| 1. 事業の緊急性       | 現況問題の深刻性、人道的支援の観点からの緊急性が高いか |
| 2. EIRR         | 国民経済的に有用なプロジェクトか            |
| 3. 裨益人口の大きさ     | 裨益する人口が大きいか                 |
| 4. 事業熟度         | 事業熟度が高く早期のプロジェクト実施が可能か      |
| 5. 環境社会配慮の必要性   | 環境社会配慮面での問題が少なく事業実施が容易か     |
| 6. 他プロジェクトとの関連性 | 他プロジェクトとの事業時期の調整が必要か        |
| 7. その他特記事項      |                             |
| 8. 総合評価         |                             |

提案された都市施設復旧復興マスタープランのプログラムを以下に示す。

表 9-4 都市施設復旧復興マスタープランのプログラム(短期及び中期)

分野	プロジェクト	年												
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
社会経済フレーム	モンロビア大都市圏人口	1,010,575						1,250,000						1,470,000
	一人当たり国内総所得(US\$)(リベリア)	196.5						348.1						560.6
	モンロビア大都市圏の産業(括弧内は2008年からの増加ポイント)	第一次 2.93%						第一次 2.00% (-0.93)						第一次 1.00% (-1.93)
		第二次 12.55%					第二次 12.67% (+0.12)						第二次 12.80% (+0.25)	
		第三次 84.52%					第三次 85.33% (+0.81)						第三次 86.20% (+1.68)	
モンロビア大都市圏の人口配分														
将来社会経済フレームを基にした人口配分														
土地利用	用地需要予測/土地利用ゾーニング													
社会経済フレーム及び人口配分を基に用地需要を予測し土地利用ゾーニングを作成														
人口配分及び用地需要予測を基に各分野の需要を予測														
道路・交通	目標	<p>2014 年次目標</p> <ul style="list-style-type: none"> <li>・継続された都市道路ネットワークを構築し、道路階層構造を導入する</li> <li>・不連続道路を整備し、損壊橋梁の復旧の整備によって年間を通じた交通を確保する</li> <li>・バス停施設の整備を行い、定期公共交通サービスを増強させる</li> </ul> <p>2019 年次目標</p> <ul style="list-style-type: none"> <li>・道路ネットワーク機能を増強させる(交通容量拡大、道路舗装、連続性の確保)</li> <li>・総合的な公共交通システムを導入し、乗り換えターミナルを整備する</li> <li>・道路管理・管制システムを導入する</li> </ul>												
上水道	目標	<p>2014 年次目標</p> <ul style="list-style-type: none"> <li>・モンロビア大都市圏の水通普及率を約70%にする</li> </ul> <p>2019 年次目標</p> <ul style="list-style-type: none"> <li>・モンロビア大都市圏の水通普及率を約100%にする</li> </ul>												
下水・衛生	目標	<p>2014 年次目標</p> <ul style="list-style-type: none"> <li>・モンロビア大都市圏の衛生設備アクセス率を約50% (MDG 対象40%)にする</li> </ul> <p>2019 年次目標</p> <ul style="list-style-type: none"> <li>・モンロビア大都市圏の衛生設備アクセス率を約80% (MDG 対象)</li> </ul>												
雨水排水	目標	<ul style="list-style-type: none"> <li>・排水管網洗浄車の整備及び維持管理マニュアル整備によって維持管理能力を強化する</li> <li>・排水路建設によって排水能力を強化する</li> <li>・内戦で破損した排水施設の機能を復旧する</li> </ul>												
コミュニティインフラ改善	目標	<ul style="list-style-type: none"> <li>・コミュニティの生活水準を向上させる</li> <li>・コミュニティエンパワーメントを行う</li> <li>・職業の創出を行う</li> <li>・モンロビア大都市圏において破損したコミュニティ道路を復旧する</li> <li>・集落とのアクセスを確保する</li> <li>・安全な水を確保する</li> <li>・衛生サービスを確保する</li> </ul>												

## 第10章 環境社会配慮

### 10.1 「リ」国の環境影響評価制度

#### 10.1.1 環境保護庁 (EPA)

EPA は「リ」国の環境行政を所轄する機関である。環境保護庁設立法案は 2002 年 11 月 26 日に成立した。同庁は 2004 年 4 月から暫定的に活動を開始し、2006 年の現 Ellen Johnson-Sirleaf 大統領の就任後、全面的に活動を開始した。

#### 10.1.2 その他 EPA の管轄外の主要な情報

- **ラムサール条約に登録された湿地帯**：現在、「リ」国では総面積95,879haから成る 5 ヶ所の湿地帯がラムサール条約に登録されている。
- **歴史的遺産**：「リ」国には建物、記念碑、史跡、公文書館等の歴史的遺産があり、そのほとんどが首都モンロビアに集中している。
- **歴史的建造物**：市内には、19世紀中ごろ建築されたアメリカ南部様式を用いた歴史的建造物が二ヶ所ある。一つはGurleyとSao Boso通りの交差点にあるWilliam David Coleman大統領の邸宅跡、もう一つはAshmun通りに面した法律図書館である。
- **史跡**：歴史的建造物と同様に、史跡のほとんどはアメリカ系リベリア人に関するもので首都の沿岸部にある。

#### 10.1.3 土地問題

先住民にとって土地は部族の共有物であったが、1822年以後は英米的所有制度が適用されてきた。しかし、先住民には土地は売買の対象物とは看做されず、登録による所有権画定はなじみの薄い制度であった。しかし、この登録制度も入植者による開拓と地方における経済活動の活発化に伴い不法占拠が進み、土地所有権と土地使用をめぐる紛争が増大している。

### 10.2 事業に伴う環境アセスメント許可の取得

「環境保護法第6章」の付属書1によると道路改修/拡幅計画、都市下水処理施設計画、給水計画等の事業実施にあたっては事業アセスメントが必要とされている。しかし、本調査において実施した MPW の環境専門家からの聞き取り調査によれば、現況施設の復旧/改修計画には全面的な事業アセスメントは必要とされず、環境管理計画の提出をもって申請が開始される。

公共事業省が実施する事業の環境管理は副大臣の直轄の下、SIU (Special Implementation Unit)が担当しており、8名の職員で行われている。

環境アセスメント申請に係る関連省庁/機関及びステークホルダの役割を示す。

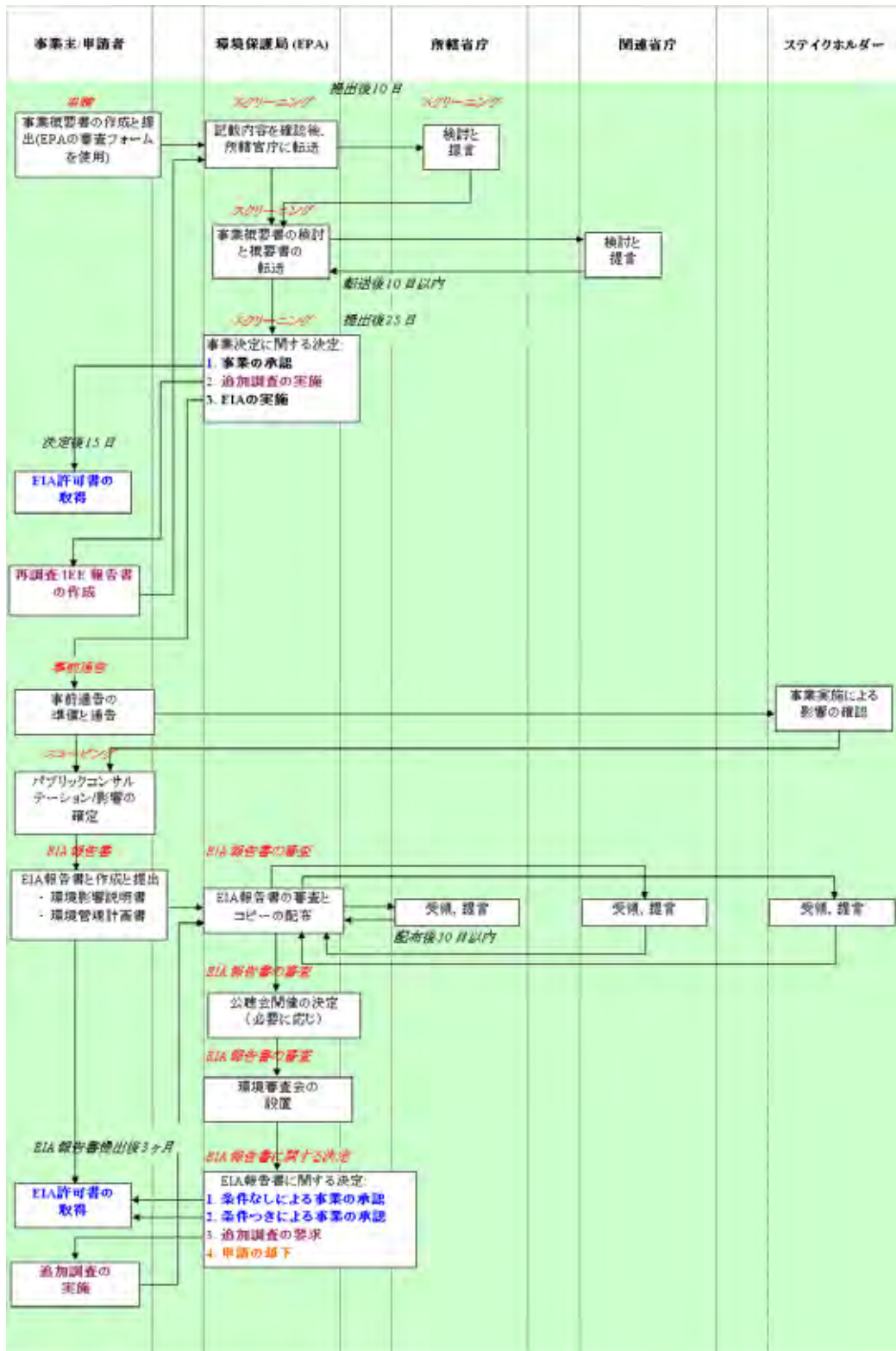


図 10-1 環境アセスメントに係る手順



### 10.3 本 M/P 調査で選定されたプロジェクトに対して実施した IEE

表 10-1 選定されたプロジェクトに対する IEE

案件名	資金源	案件内容	影響の内容	カテゴリー
1. 道路交通分野				
1.1 ジョンソンストリート橋梁改良計画	無償資金協力を要請中	施設建設	<ul style="list-style-type: none"> <li>○ 走行速度が改善され、排出される二酸化炭素量が減少する</li> <li>○ 市場・学校・病院等への利便性が向上する</li> <li>● Clara Town において非自発的住民移転が発生するおそれがある</li> <li>● Mesurado 湿地帯の自然環境が悪化するおそれがある</li> </ul>	A
1.2 モンロビア首都圏ソマリアドライブ復旧計画	無償資金協力を要請中	施設建設	<ul style="list-style-type: none"> <li>○ 走行速度が改善され、排出される二酸化炭素量が減少する</li> <li>○ 市場・学校・病院等への利便性が向上する</li> <li>● 沿線上の ROW 内の商店・露店に非自発的住民移転が発生するおそれがある</li> </ul>	A
1.3 ミッシングリンク橋梁復旧計画	無償資金協力を要請中	施設建設	<ul style="list-style-type: none"> <li>○ 市場・学校・病院等への利便性が改善され、村民の生活水準が向上する</li> <li>● 一部で用地取得が発生する恐れがある</li> </ul>	B
1.4 Road Rehabilitation Project	計画中	施設建設	<ul style="list-style-type: none"> <li>○ 市場・学校・病院等への利便性が改善され、村民の生活水準が向上する</li> <li>● Package-3 において Mesurado 湿地帯の自然環境が悪化するおそれがある</li> <li>● 道路新設/拡張に伴い、非自発的住民移転が発生するおそれがある</li> </ul>	A、B
1.5 Intersection Improvement Project	計画中	施設建設	<ul style="list-style-type: none"> <li>○ 交通渋滞が緩和され、排出される二酸化炭素量が減少する</li> <li>○ 道路利用者の安全性が向上する</li> <li>● 交差点改良に伴い、非自発的住民移転が発生するおそれがある</li> </ul>	B
1.6 Bus Terminal & Bus Stop Facilities Construction Project	計画中	施設建設	<ul style="list-style-type: none"> <li>○ 公共交通サービスが向上する</li> <li>○ 車両から排出される二酸化炭素量が減少し、タクシーによる交通渋滞が緩和される</li> <li>● タクシー運転手の現金収入が減る</li> <li>● バスターミナル改修には、一部用地取得が必要と推測される</li> </ul>	B
1.7 Traffic Safety Management Project	計画中	技プロ	<ul style="list-style-type: none"> <li>○ 交通安全が改善される</li> <li>● 特記すべき影響はない</li> </ul>	
1.8 Vai Town Bridge Reconstruction Project	WB により実施中	施設	<ul style="list-style-type: none"> <li>○ 走行速度が改善され、排出される二酸化炭素量が減少する</li> <li>○ 市場・学校・病院等への利便性が向上する</li> <li>● 非自発的住民移転が発生する</li> <li>● Mesurado 湿地帯の自然環境が悪化するおそれがある</li> </ul>	
1.9 Rehabilitation of Monrovia City Street Project	WB により実施中	施設建設	<ul style="list-style-type: none"> <li>○ 走行速度が改善され、排出される二酸化炭素量が減少する</li> <li>○ 市場・学校・病院等への利便性が向上する</li> <li>○ 経済活動活発になる</li> <li>● 負の影響：特記すべき影響はない</li> </ul>	
1.10 Caldwell Bridge Construction Project	WB により実施予定	施設建設	<ul style="list-style-type: none"> <li>○ 住民の生活水準が向上する</li> <li>○ 市場・学校・病院等への利便性が向上する</li> <li>● 新規取付け道路部で非自発的住民移転が発生する</li> </ul>	

案件名	資金源	案件内容	影響の内容	カテゴリー
<b>2. 上水道分野</b>				
2.1 Monrovia Water and Sanitation Rehabilitation Program	WB、EU、DIFID、AfDB により実施中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 特記すべき影響はない	
2.2 Monrovia Expansion and Rehabilitation of Three County Capitals	AfDB により実施中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 既存の井戸の水位が低下するおそれがある	
2.3 モンロビア首都圏ペインズビル地区上水道緊急整備計画	無償資金協力を要請中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 既存の井戸の水位が低下するおそれがある	B
2.4 The Project for Expansion Development of the White Plain Water supply System and isolation of service areas	計画中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 中継ポンプ場の建設に伴い、用地収容が必要となるおそれがある	B
2.5 Assistance on Groundwater Management Plan	計画中	技プロ	○ 上水道に係る維持管理能力が向上する ● 特記すべき影響はない	
2.6 Non-revenue Water Improvement Plan	計画中	技プロ	○ 上水道に係る維持管理能力が向上する ● 特記すべき影響はない	
2.7 The Project for Emergency Development of Water Supply System at Paynesville in Greater Monrovia (Phase 2)	計画中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 既存の井戸の水位が低下するおそれがある	B
<b>3. 下水道分野</b>				
3.1 Monrovia Water and Sanitation Rehabilitation Program	WB、EU、DIFID、AfDB により実施中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 特記すべき影響はない	
3.2 Urban Infrastructure Construction and Rehabilitation of Monrovia Sewerage Network Pumping Stations	WB により実施中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 中継ポンプ場の建設に伴い、用地収容が必要となるおそれがある	
3.3 Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement Plan	計画中	施設建設及び機材供与	○ 衛生状況が改善され、住民の生活水準が向上する ● 負の影響：特記すべき影響はない	C
3.4 The Project for Reconstruction of Sewage Treatment & Sludge Treatment	計画中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 施設の拡張に伴い、用地収容が必要となるおそれがある ● 排出施設改修は Mesurado 湿地帯の自然環境を悪化させるおそれがある	A
3.5 Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement Plan	計画中	施設建設及び機材供与	○ 衛生状況が改善され、住民の生活水準が向上する ● 特記すべき影響はない	C
<b>4. 雨水排水分野</b>				
4.1 Improvement of Drainage System of Core Area	計画中	施設建設	○ 衛生状況が改善され、住民の生活水準が向上する ● 特記すべき影響はない	C
4.2 Equipment Supply of Drainage Pipes Cleaning	計画中	機材供与	○ 衛生状況が改善され、住民の生活水準が向上する ● 特記すべき影響はない	C
4.3 Establishment of Operation and Maintenance Management System	計画中	技プロ	○ 衛生状況が改善され、住民の生活水準が向上する ● 特記すべき影響はない	

○ 正の影響、● 負の影響

## 第11章 運営維持管理

### 11.1 道路交通分野

公共事業省は現在、道路維持管理システムの再構築を実施中である。新たな組織は、5つの地域管理体から構成される。これらはそれぞれ3つの地方を管轄する。各々の地域は、独自に道路維持管理設備を持つ地域センターを持つ。

地域支線道路は、建設局の支線道路部門により管理される。しかしモンロビア都市圏の支線の道路網密度が高いわりに、それらの維持管理を行う関連人員は少ない。このためモンロビア都市圏では、全体を網羅できる別途の道路維持管理システムの構築が必要である。

#### 11.1.1 運営システム

第一に、公共事業省が道路を維持管理するためのデータベースの構築が必要である。モンロビア都市圏の道路区間数は数千にも及ぶため、公共事業省の組織であるいは民間委託で補修を行うかの判断を行い、事前のリスト作成が必要である。全国交通政策戦略計画では、集落と農場やその他経済活動地域を連絡する道路や小道の維持管理は、その地域の地域共同体や民間共同体等の自治体で責任を負うとしている。このため、地域の小規模道路の維持管理は、公共事業省直属ではなく地域の民間組織の導入が推奨される。道路維持管理への民間部門の参入は、低費用化、効率化、維持管理機材への投資低減等の利点がある。この方法では、ある地域の道路の維持管理を、年間や適切な期間での出来高払いでの契約が可能である。また、この方法は、適切な競争入札の導入による透明性確保や「リ」国の建設業の成長に貢献する。本調査では、モンロビア都市圏において民間部門活用・参入、モンロビア都市圏外ではその地域の労働力を活用した道路維持管理システム、さらに道路維持管理全体の計画は中央政府組織で行うことを推奨する。

#### 11.1.2 資金計画

道路の整備及び維持管理に必要な資金を確保するため、中央政府で採用し管理する以下の4つの税制対策が推奨される。これらの税金導入については、財務省、運輸省、モンロビア市、「リ」国家警察等関連組織との調整が必要である。

- 燃料税 : 道路インフラ整備のための特定税
- 路上駐車場収入 : 道路上の私有占有の駐車料金
- 車両税 : 車両の登録費用
- 通行税 : 国境通過交通の道路利用税

### 11.2 上水道分野

#### 11.2.1 サテライト型上水道システム

##### (1) 関連組織の役割及び責務

LWSC はホワイト・プレーン上水道システムだけではなく、サテライト型上水道システムの管理責任機関である。地下水の水源施設である井戸内の目詰まり等のようなトラブルに備え、LWSC は MLME と連携し維持管理を対応する。

##### (2) 上水道システム供用開始前の準備

表 11-1 LWSC によるアクション

アクション	目的
● コミュニティー水委員会設立支援	● コミュニティーレベルでの水委員会設立
● 公共水栓別給水区域の確定と区域図作成	● 公共水栓利用者数の均等化
● 水道料金の設定 (単価: LSD/ガロン)	● コミュニティーによる上下水道システムの持続
● 料金帳簿や運転・購入記録ノートの準備	● 体系的な料金徴収や燃料調達管理
● 運転・維持管理と料金徴収に関して水委員会のスタッフへの訓練指導	● コミュニティーによる上下水道システムの運転・維持管理

出所: JICA 調査団

表 11-2 コミュニティーによるアクション

アクション	目的
<ul style="list-style-type: none"> <li>コミュニティ水委員会の設立</li> </ul>	<ul style="list-style-type: none"> <li>サテライト型上水道システム運営（運転・管理、料金徴収）</li> </ul>
<ul style="list-style-type: none"> <li>運転・維持管理要員と公共水栓管理要員、公共水栓管理要員の代表者の人選</li> </ul>	<ul style="list-style-type: none"> <li>サテライト型上水道システム運営（運転・管理、料金徴収）</li> </ul>
<ul style="list-style-type: none"> <li>水委員会水基金の設立</li> </ul>	<ul style="list-style-type: none"> <li>初期費用徴収（燃料費、修理費、消毒用塩素剤等）</li> </ul>
<ul style="list-style-type: none"> <li>燃料や消毒用塩素剤の調達</li> </ul>	<ul style="list-style-type: none"> <li>サテライト型上下水道システムの日常運転</li> </ul>

出所： JICA 調査団

### (3) 運転・維持管理費

燃料費等の消耗品は全裨益者によって賄われる。世帯構成人員が 5 名の場合、月 7 米ドルのコスト支出が不可欠となる。

## 11.2.2 ホワイト・プレーン上下水道システム

### (1) 関連組織の役割及び責務

LWSC の運転課はホワイト・プレーン上水道システムの運転・維持管理の責任部署である。一方、コミュニティレベルでは以下のような日常の役割が提案される。

- 公共水栓を利用する住民から徴収した料金を LWSC へ毎週納金
- 上水道システムの日常機器及び安全点検
- 料金収入や公共水栓における水量の日常記録
- LWSC に対する上下水道システムに係る事故等の報告

### (2) コミュニティー（新規給水区域）による準備

表 11-3 コミュニティーによるアクション

アクション	目的
<ul style="list-style-type: none"> <li>コミュニティ水委員会の設立</li> </ul>	<ul style="list-style-type: none"> <li>上下水道システムの持続</li> </ul>
<ul style="list-style-type: none"> <li>公共水栓管理要員と公共水栓管理要員の代表者の人選</li> </ul>	<ul style="list-style-type: none"> <li>料金徴収</li> </ul>

出所： JICA 調査団

### (3) 運転・維持管理費

運転・維持管理費は 2014 年で 100 ガロンあたり 0.31 米ドル（1m<sup>3</sup>あたり 0.81 米ドル）、2019 年で 100 ガロンあたり 0.26 米ドル（1m<sup>3</sup>あたり 0.81 米ドル）となる。

## 11.2.3 上水道運営に係る提案

- |                 |                |
|-----------------|----------------|
| a. 水質分析の改善      | d. 水道料金徴収率の改善  |
| b. 有収率の改善       | e. LWSC 職員の合理化 |
| c. 水道料金システムの見直し |                |

## 11.3 下水・衛生分野

### 11.3.1 コミュニティー衛生委員会及び公共トイレ委員会

#### (1) コミュニティー衛生委員会

コミュニティ衛生システムの適切な管理を行うためには、コミュニティ衛生委員会がそれぞれのコミュニティ衛生システムに設立されることが必須である。同委員会は、システム利用料金徴収と維持管理に関して LWSC と協定を締結する必要がある。一世帯当りのシステム利用料金は、0.55 米ドル/月である。

## (2) 公共トイレ委員会

公共トイレの適切な管理のためには、公共トイレ委員会が各公共トイレに設立されることが必須である。同委員会は、公共トイレ利用料金徴収と維持管理に関して LWSC と協定を締結する必要がある。一世帯当りの利用料金は、1.05 米ドル/月である。

### 11.3.2 LWSC における下水・衛生施設の O&M 組織計画

#### (1) 必要な O&M 要員

将来（2014 年及び 2019 年）の施設 O&M のための必要な要員は、下表のように計画した。

表 11-4 将来の施設に必要なスタッフ数

施設	2014 年	2019 年
Fiama 下水・汚泥処理場	0	13
下水中継・揚水ポンプ場	4	4
下水管網	8	8
コミュニティー衛生システム及び公共トイレ	18	32
合計	30	57

出所：JICA 調査団

表 11-5 将来の維持管理に必要な LWSC のスタッフ数

項目	2009 年	2014 年	2019 年
LWSC 総職員数	140	260	400
O&M 要員数	43	78	120
下水・衛生分野 O&M 要員	8	30	57

出所：JICA 調査団

#### (2) 組織計画

LWSC の下水・衛生分野組織は、Fiama 下水・汚泥処理場、中継ポンプ場及び下水管網の復旧、並びに、コミュニティー衛生システムと公共トイレの整備を考慮して計画した。

### 11.3.3 O&M コスト見積り

上記施設の目標年次 2019 年における O&M コストは、283 万米ドルと見積もられる。

## 11.4 雨水排水分野

### 11.4.1 要員計画及び予算

維持管理は、水路網及び地下排水管網を清掃することにより、施設を資産としての価値を保つことになる。それに必要な要員は下表のよう要員数 26 名が必要される。水路網や排水管網の堆積物浚渫に必要な洗浄関係車両の運転維持費は年間 195,000 米ドルが必要である。

表 11-6 維持管理要員数

分類	技術職	会計職	技能職	一般労務
モンロビア首都圏	1	1	15	9

### 11.4.2 維持管理組織整備に関する提言

#### (1) 組織

排水施設の機能が発揮されるには、持続する維持管理組織を速やかに設置することが求められ、また、緊急事態にも対応することが望ましい。維持管理業務には、周辺住民の参加を積極的に取り込むことにも配慮することが必要である。

## (2) 排水系統の設備要覧と記録の整備

設備要覧や管理記録は常時閲覧できるようにすると共に、記録保持、整理・改定するように努める。

## (3) 排水施設維持管理の流れ

排水施設の維持管理は図に示す流れに沿って行うことが望ましい。

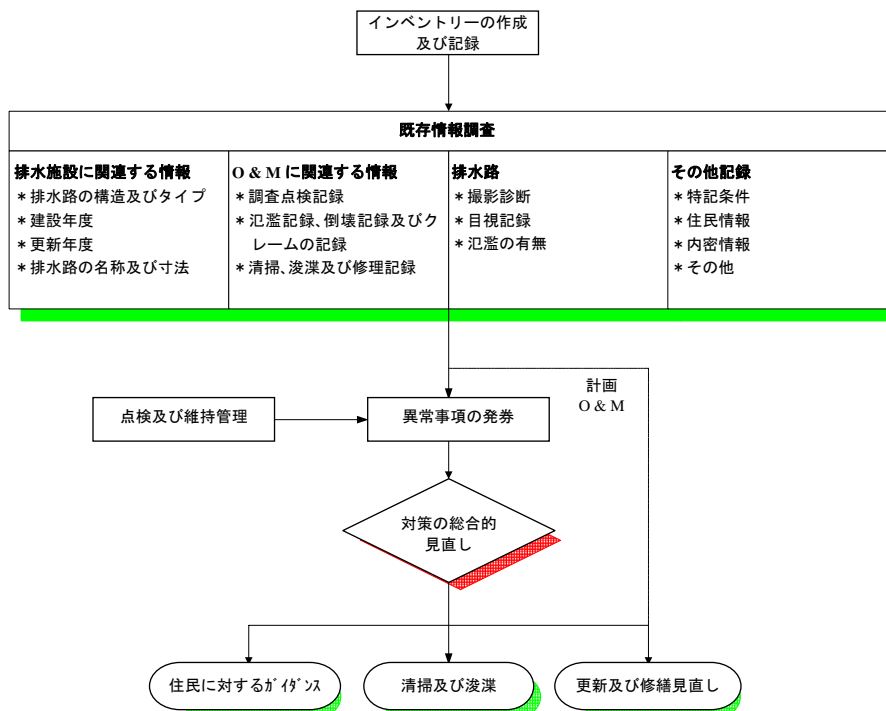


図 11-1 維持管理業務

## 第12章 結論と提言

### 12.1 結論

#### 12.1.1 マスタープラン全体

本調査では都市インフラのうち、道路、給水、下水、雨水排水の4分野を対象にコミュニティーや総合化に配慮しつつ、MDGを目標とした復旧・復興計画として取りまとめている。しかし、電力分野や環境分野での案件形成は対象外であることに留意する必要がある。

#### 12.1.2 道路交通分野

道路分野では2019年の幹線道路、補助幹線道路、区画道路の整備率（道路改良）を100%とした整備目標を設定し、復旧・復興計画を提案した。

#### 12.1.3 上水道分野

給水分野では河川取水と地下水開発により2019年の世帯への給水普及率100%（共同給水栓によるものを含む）を目標として復旧・復興計画を提案している。

#### 12.1.4 下水・衛生分野

下水・衛生分野ではモンロビア首都圏での2019年の下水処理世帯率80%（MDG換算で68%）を目標として復旧・復興計画を提案した。

#### 12.1.5 雨水排水分野

雨水排水分野ではCentral Monroviaを対象とし、2014年までの短期計画として排水施設（開渠、地下雨水管渠及びマンホール）の復旧・復興計画を提案した。

### 12.2 提言

#### 12.2.1 計画／実施上の提言

##### (a) 計画の認定

関係者が共通の方向・目標を持って系統的にモンロビア首都圏の復興・開発を推進するためには、本調査で策定した復旧・復興計画が短期（2014年）及び中期（2019年）のマスタープランとして正式に認定される必要がある。本計画を構成する事業／プログラムが、国家・地域開発計画に組み込まれれば予算の裏づけが可能となる。

##### (b) タイムリーなフィージビリティ調査の実施

マスタープランではプロジェクトの概念と概要のみの提示であるため、詳細についてのタイムリーなフィージビリティ調査を実施する必要がある。

##### (c) 資金の確保／増加

計画の実現には多額の資金が必要である。資金確保のため、民間資金の導入、新たな税制度の導入、受益者負担原則の導入、コミュニティーの活用等様々な手段を検討し、導入を図るべきである。

##### (d) 労働集約型施工の導入

プロジェクトの実施にあたっては雇用機会を増加させるため、積極的に労働集約型施工の促進を

図るべきである。

**(e) 十分な維持管理の実施**

事業効果が発現するよう、施設を常時、良好な運用状態に保ち、施設の耐用期間を延ばすための十分な維持管理を行うことが望ましい。

**(f) 地場建設関連業の育成**

地場産業としての建設関連業の育成は地域の社会経済発展のため重要であり、コンサルタントサービス、建設、建設資材供給、技術調査、技能訓練、建設機械リース、契約保証・保険、資金貸し付け等の建設支援業務等について地場産業参入の可能性を拡大していくべきである。

**(g) 計画の見直し**

本計画は折に触れて計画の見直しを行い、社会経済状況の変化に応じて調整する必要がある。

## 12.2.2 環境社会配慮に係る提言

**(a) 的確な環境アセスメントの実施**

ODAによるプロジェクトの実現に向け、環境法に基づいた社会環境影響評価を遅滞なく実施していく必要がある。

**(b) 土地利用計画の公的な承認**

本調査で提案した土地利用ゾーニングに基づき、建築行為や開発行為を規定・誘導する土地利用ゾーニングを確定し、公的なものとして承認することが必要である。

**(c) ラムサール条約指定区域の詳細検討**

ラムサール条約に基づく指定区域は、本調査でも指摘しているが、現状調査に基づくより詳細な区域指定が必要である。

## 12.2.3 組織制度に係る提言

**(a) 行政組織の能力向上**

現在の行政組織ではそれぞれの業務を熟知していない職員が多く、また職員数を増強する必要があるが、経験のある人材の雇用は容易ではない。十分な組織の構築、職員数の増強、職員の能力開発が必要となっている。

**(b) 建設用輸入資機材の優遇税制**

現在、資機材のほとんどを輸入に依存しているため、それらのコストが高水準に止まり、事業費が増大している。そのため輸入資機材に対する優遇税制（場合によっては、関税免除）の適用を提言する。

## 12.2.4 コミュニティー開発に係る提言

**(a) コミュニティー独自の開発計画の策定**

限られた公的資金の効率的活用のために、政府の基本方針に沿って、コミュニティ主導で、コミュニティニーズに基づく復旧復興計画を作成することが望ましい。


**(b) 政府主導事業へのコミュニティの参画**

インフラ整備事業は政府主導プロジェクトであるが、建設段階、運営維持管理段階においても自助努力の形成と就業機会拡大のためコミュニティの参画を拡大していくべきである。



## 付録


## Project Profile

Project No. and Project Name: TR-1, Johnson Street Bridge Improvement Project																																												
<b>Background of the Project</b> The existing bridge is located at the entrance of Central Monrovia where the most developed Central Business District (CBD) is located. The access to CBD is only allowed by UN Drive from northern area and Tubman Boulevard from eastern area. Both approaching roads of the bridge have multi lanes for one direction, but the bridge does not have enough width for multi lane operation, so the carriageway is divided to provide one lane for one direction. This narrowed section is the bottle neck of the traffic. Another bridge, called Vai Town Bridge located on UN Drive, for access to CBD collapsed in 2006. The reconstruction project is scheduled to complete in 2010. Although this new bridge will be provided, the capacity of the two bridges is insufficient according to the traffic forecast. The traffic congestion of the roads on both sides of the bridge will be worse near future.	<b>Effects of the Project</b> <b>Target Beneficiaries:</b> <ul style="list-style-type: none"> <li>• Whole population of Greater Monrovia of about 1 million</li> </ul> <b>Effects:</b> <ul style="list-style-type: none"> <li>• Vehicle operation cost savings and travel time reduction</li> <li>• Exact operation of public transport</li> <li>• Reduction of energy loss and exhaust fume</li> </ul>																																											
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>• To mitigate traffic congestion</li> <li>• To provide favorable and acceptable road service at crossroad of Mesurado marshland</li> </ul>	<b>Evaluation of the Project</b> <b>Economic Viability:</b> <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.</li> <li>NPV : USD 17.6 mln</li> <li>B/C : 1.85</li> <li>EIRR: 22.37 %</li> </ul> <b>Financial Soundness:</b> <ul style="list-style-type: none"> <li>• Requested Japan’s Grant Aid</li> </ul> <b>Environmental Impact: Category A</b> <ul style="list-style-type: none"> <li>• Positive Impacts                             <ul style="list-style-type: none"> <li>• Improve travel speed and mitigate CO2 emission gas</li> <li>• Improve accessibility to social/public facilities</li> </ul> </li> <li>• Negative Impacts                             <ul style="list-style-type: none"> <li>• Involuntary resettlement is required in Via Town</li> <li>• Negative impact against Mesurado wetland</li> </ul> </li> </ul>																																											
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>• Central Monrovia and Clara Town District in Greater Monrovia</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <b>Preconditions</b> <ul style="list-style-type: none"> <li>• Road right-of way is secured.</li> <li>• Market and vendors within the right-of-way are removed.</li> <li>• Necessary fund is prepared.</li> </ul>																																											
<b>Scope of the Project</b> Construction of: <ul style="list-style-type: none"> <li>• New Bridge parallel to the existing bridge: 450 m</li> <li>• Approach Road: 400 m</li> </ul>																																												
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Operation : Ministry of Public Works</li> <li>• Maintenance : Ministry of Public Works</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>• “Vai Town Bridge Reconstruction Project” will provide better access to CBD together with this project.</li> <li>• “Rehabilitation of Monrovia City Street Project” will be the precondition of increasing traffic from the bridge.</li> </ul>																																											
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>• Detailed Design &amp; Supervision Cost: USD 2.2 mln.</li> <li>• Construction:                             <ul style="list-style-type: none"> <li>Bridge: USD 20.9 mln.</li> <li>Approach Road: USD 0.9 mln.</li> </ul> </li> <li>• Total Cost: USD 24.0 mln.</li> </ul>																																												
<b>Implementation Schedule</b> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Design &amp; bid</td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Bridge</td> <td></td> <td></td> <td>█</td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Approach Road</td> <td></td> <td></td> <td></td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Design & bid	█	█									Bridge			█	█	█						Approach Road				█	█				
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019																																		
Design & bid	█	█																																										
Bridge			█	█	█																																							
Approach Road				█	█																																							

## Project Profile

Project No. and Project Name: TR-2 Somalia Drive Reconstruction Project																																												
<b>Background of the Project</b> Somalia Drive is one of the busiest primary roads in Greater Monrovia. This road was rehabilitated by the World Bank grant in 2008. The original road width had 4 lane carriageway, but only 2 lanes were rehabilitated. The road is located to the north of Mesurado marshland. The land use of the roadside is mainly commercial including the Ma-juah market, nearby stalls and some open garages. The vicinity consists of many narrow community alleys which connect directly to Somalia Drive, thereby causing congestion as vehicles from such community alleys try accessing the Somalia Drive. The congestion has caused severe economic losses over time, and is projected to increase by 2014. Therefore, the upgrade of road capacity to secure smooth traffic flow is necessary, as it completes the ring road in Greater Monrovia Area that connects with Tubman Boulevard.	<b>Effects of the Project</b> <b>Target Beneficiaries :</b> <ul style="list-style-type: none"> <li>• Whole population of Greater Monrovia of about 1 million</li> </ul> <b>Effects:</b> <ul style="list-style-type: none"> <li>• Vehicle operation cost savings and travel time reduction</li> <li>• Exact operation of public transport</li> <li>• Reduction of energy loss and exhaust fume</li> </ul>																																											
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>• To mitigate traffic congestion</li> <li>• To provide favorable and acceptable road service at ring road around Mesurado marshland</li> </ul>	<b>Evaluation of the Project</b> <b>Economic Viability</b> <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.</li> <li>NPV : USD 47.4 mln</li> <li>B/C : 3.12</li> <li>EIRR: 20.72 %</li> </ul> <b>Financial Soundness</b> <ul style="list-style-type: none"> <li>• Requested Japan’s Grant Aid</li> </ul> <b>Environmental Impact: Category A</b> <ul style="list-style-type: none"> <li>• Positive Impacts                             <ul style="list-style-type: none"> <li>Improve travel speed and mitigate CO2 emission gas</li> <li>Improve accessibility to social/public facilities</li> <li>Enhance economic activity</li> </ul> </li> <li>• Negative Impacts                             <ul style="list-style-type: none"> <li>Involuntary resettlement such as permanent structures, temporary kiosks, vendors located within ROW is required along the Project road</li> </ul> </li> </ul>																																											
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>• Clara Town, New Georgia, Gardnersville and Paynesville District in Greater Monrovia</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <b>Preconditions</b> <ul style="list-style-type: none"> <li>• Clear the road reserve and relocate the people making business within Right of Way</li> <li>• Necessary fund is prepared.</li> </ul>																																											
<b>Scope of the Project</b> Construction of: <ul style="list-style-type: none"> <li>• Expanding carriage way to 4 lanes for 13 km stretch</li> <li>• Additional Bridge on Stockton Bridge</li> <li>• Rehabilitation of existing Double Bridge</li> <li>• Improvement of major intersections</li> </ul>																																												
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Operation : Ministry of Public Works</li> <li>• Maintenance : Ministry of Public Works</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>• “Vai Town Bridge Reconstruction Project” and “Johnson Street Bridge Improvement Project” will mitigate the traffic congestion at Free Port Intersection.</li> <li>• “Road Rehabilitation Project” will create adequate road network and reduce the direct access from small alleys to Somalia Drive.</li> </ul>																																											
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>• Detailed Design &amp; Supervision Cost: USD 1.91 mln.</li> <li>• Construction:                             <ul style="list-style-type: none"> <li>Earth Work: USD 2.285 mln.</li> <li>Pavement: USD 9.790 mln.</li> <li>Road Facilities: USD 3.515 mln.</li> <li>Bridge: USD 3.600 mln.</li> </ul> </li> <li>• Total Cost: USD 21.10 mln.</li> </ul>																																												
<b>Implementation Schedule</b> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Design &amp; bid</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Road</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Bridge</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Design & bid											Road											Bridge									
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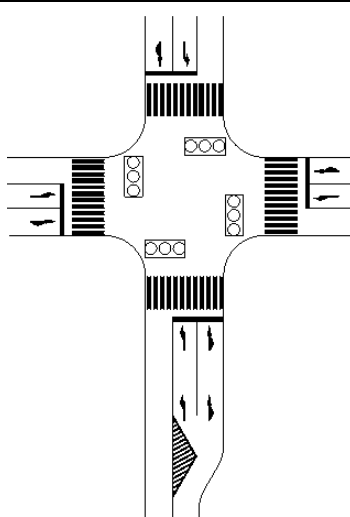
## Project Profile

Project No. and Project Name: TR-3 Reconstruction of Bridges on Missing Link																																												
<p><b>Background of the Project</b></p> <p>After civil strife, the primary roads were rehabilitated with the assistance of several donors, and some secondary roads and urban streets rehabilitation works are going to be implemented as well. However recovery and maintenance of feeder roads have not been carried out enough so far. The condition of road is getting worse by heavy rain, and the damaged roads are becoming impassable by vehicle.</p> <p>There are several reasons for this impassability, such as washing away of the road embankment, large gap by deep erosion, inundation on road, muddy surface, no appropriate crossing across the water stream and so on. The damage of the feeder roads that directly support the daily activities of residents makes the movement of the people difficult, as transport service is only available on the main road. The recovery of missing link to/from the communities is an important issue for commuters and neighborhoods.</p>	<p><b>Effects of the Project</b></p> <p>Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>Approximately 550 thousand people living in the northern 5 districts</li> </ul> <p>Effects:</p> <ul style="list-style-type: none"> <li>Utilization of sustainable road service</li> <li>Exchange of social &amp; economic activities between villages</li> <li>Improvement of convenience &amp; time saved for travel</li> <li>Provide opportunities to access market business</li> </ul>																																											
<p><b>Objectives of the Project</b></p> <ul style="list-style-type: none"> <li>To secure passable road even during rainy season</li> <li>To secure the daily activities of suburb residents</li> <li>To improve farm to market accessibility</li> </ul>	<p><b>Evaluation of the Project</b></p> <p>Economic Viability</p> <ul style="list-style-type: none"> <li>Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.</li> <li>NPV : USD 26.4 mln</li> <li>B/C : 3.69</li> <li>EIRR: 32.7 %</li> </ul> <p>Financial Soundness</p> <ul style="list-style-type: none"> <li>Requested Japan’s Grant Aid</li> </ul> <p>Environmental Impact: <b>Category B</b></p> <ul style="list-style-type: none"> <li>Positive Impacts <ul style="list-style-type: none"> <li>Improve the living standard of suburb residents</li> <li>Improve the accessibility to social/public facilities for residents</li> </ul> </li> <li>Negative Impacts <ul style="list-style-type: none"> <li>Specific negative impact is not found.</li> </ul> </li> </ul>																																											
<p><b>Location of the Project</b></p> <ul style="list-style-type: none"> <li>New Georgia, Gardnersville, Barnersville, Caldwell and Paynesville District in Greater Monrovia</li> </ul>	<p><b>External Conditions</b></p> <ul style="list-style-type: none"> <li>Good peace and order is maintained.</li> <li>Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <p><b>Preconditions</b></p> <ul style="list-style-type: none"> <li>Securing the land as Right of Way</li> <li>Rehabilitation of access road to the site</li> <li>Necessary fund is prepared.</li> </ul>																																											
<p><b>Scope of the Project</b></p> <p>Construction of:</p> <ul style="list-style-type: none"> <li>11 bridges on Missing Links</li> <li>Approach road of bridges</li> </ul>	<p><b>Relationship with other projects</b></p> <ul style="list-style-type: none"> <li>“Road Rehabilitation Project” will rehabilitate access road to the missing links from/to the main road.</li> </ul>																																											
<p><b>Agencies Responsible</b></p> <ul style="list-style-type: none"> <li>Project Implementation : Ministry of Public Works</li> <li>Operation : Ministry of Public Works</li> <li>Maintenance : Ministry of Public Works</li> </ul>																																												
<p><b>Estimated Cost</b></p> <ul style="list-style-type: none"> <li>Detailed Design &amp; Supervision Cost: USD 1.00 mln.</li> <li>Construction: <ul style="list-style-type: none"> <li>Bridge: USD 9.15 mln.</li> <li>Approach: USD 0.49 mln.</li> </ul> </li> <li>Total Cost: USD 10.64 mln.</li> </ul>																																												
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## Project Profile

Project No. and Project Name: TR-4 Road Rehabilitation Project																																												
<p><b>Background of the Project</b></p> <p>During the civil conflict, the Ministry of Public Works lost their capacity to manage their respective functions. Almost no road maintenance has been carried out from 1986 to 2006. As a result, most roads are in very poor condition and some roads are impassable at present.</p> <p>This project includes not only primary and secondary road but also tertiary roads. The road sections under this project are 182 sections in total and these sections are divided into three (3) package depending on the criteria. Primary and secondary roads are set up in Package 1 due to the importance of the road function with the total network. In addition, missing links of tertiary roads also included in Package 1 because of the urgency to recovery to adequate condition. Total number of Package 1 is 42 sections. Basically, tertiary roads are classified into Package 2 and total number is 108 sections.</p> <p>Package 3 is set up for the necessity of special consideration on the environmental issue. The roads located within the Ramsar site of Mesurado wetlands belong to this package to separate the implementation schedule from roads of normal condition in other areas. Total number is 22 sections</p>	<p><b>Effects of the Project</b></p> <p>Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>• Whole population of Greater Monrovia of about 1 million</li> </ul> <p>Effects:</p> <ul style="list-style-type: none"> <li>• Vehicle operation cost savings &amp; travel time reduction</li> <li>• Reduction of damages on vehicle</li> <li>• Improvement of accessibility</li> <li>• Increase of maintainable road sections</li> </ul>																																											
<p><b>Objectives of the Project</b></p> <ul style="list-style-type: none"> <li>• To rehabilitate damaged roads in Greater Monrovia</li> <li>• To improve primary and secondary road network</li> <li>• To promote social and economic activities</li> <li>• To secure access from/to village</li> </ul>	<p><b>Evaluation of the Project</b></p> <p><b>Economic Viability</b></p> <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.</li> </ul> <p>NPV : USD 307.9 mln                      B/C : 4.08                      EIRR: 42.4 %</p> <p><b>Financial Soundness</b></p> <ul style="list-style-type: none"> <li>• Necessary budget allocation</li> </ul> <p><b>Environmental Impact: Category B for Package 1 &amp; 2, Category A for Package 3</b></p> <ul style="list-style-type: none"> <li>• Positive Impacts                          Improve the living standard of suburb residents                          Improvement of accessibility to social/public facilities for residents</li> <li>• Negative Impacts                          Negative impact against Mesurado wetland by Package 3                          Land acquisition to build new road or widening activity</li> </ul>																																											
<p><b>Location of the Project</b></p> <ul style="list-style-type: none"> <li>• Whole area of Greater Monrovia</li> </ul>																																												
<p><b>Scope of the Project</b></p> <p>Construction of:</p> <ul style="list-style-type: none"> <li>• 182 road sections</li> </ul>	<p><b>External Conditions</b></p> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <p><b>Preconditions</b></p> <ul style="list-style-type: none"> <li>• Necessary fund is prepared.</li> </ul>																																											
<p><b>Agencies Responsible</b></p> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Operation : Ministry of Public Works</li> <li>• Maintenance : Ministry of Public Works</li> </ul>	<p><b>Relationship with other projects</b></p> <ul style="list-style-type: none"> <li>• “Rehabilitation of Monrovia City Street Project” will be a part of rehabilitation program.</li> </ul>																																											
<p><b>Estimated Cost</b></p> <ul style="list-style-type: none"> <li>• Construction:</li> <li>• Total Cost: USD 48.28 mln.</li> </ul>																																												
<p><b>Implementation Schedule</b></p> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Package 1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Package 2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Package 3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Package 1											Package 2											Package 3									
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Package 3																																												

## Project Profile

Project No. and Project Name: TR-5 Intersection Improvement Project																																												
<p><b>Background of the Project</b></p> <p>Intersections are critical point to be considered when improving traffic flow in general. In Monrovia, traffic signals were destroyed during civil conflict and traffic congestion are observed at many intersection. Although policemen are controlling the traffic flow at major intersections, traffic conditions are yet to be solved.</p> <p>The primary roads with busy traffic, i.e. Tubman Boulevard, Ganta Highway and UN Drive, have connections with secondary roads and major feeder roads. Most intersections are not provided with channelization and/or left turn lane. In particular waiting vehicles for turning left narrows the number of carriageway and disturb smooth traffic flow on the main roads. The geometric improvement shall be recommended to solve such problems.</p> <p>Inside the Central Business District (CBD), there are many major intersections and minor junctions. However, no traffic signal is re-installed yet. The unsustainable power supply is also the problem of signal operation. Therefore this project is formulated for the medium term target.</p>	<p><b>Effects of the Project</b></p> <p>Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>• Whole population of Greater Monrovia of about 1 million</li> </ul> <p>Effects:</p> <ul style="list-style-type: none"> <li>• Vehicle operation cost savings and travel time reduction</li> <li>• Exact operation of public transport</li> <li>• Increase of safe at intersection</li> <li>• Reduction of energy loss and exhaust fume</li> </ul>																																											
<p><b>Objectives of the Project</b></p> <ul style="list-style-type: none"> <li>• To mitigate traffic congestion</li> <li>• To provide safe at intersection for road users</li> </ul>	<p><b>Evaluation of the Project</b></p> <p>Economic Viability</p> <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.</li> </ul> <p>NPV : USD 6.1 mln B/C : 2.16 EIRR: 23.4 %</p> <p>Financial Soundness</p> <ul style="list-style-type: none"> <li>• Necessary budget allocation</li> </ul> <p>Environmental Impact: <b>Category B</b></p> <ul style="list-style-type: none"> <li>• Positive Impacts Reduce traffic congestion and mitigate CO2 emission gas Improve traffic safety on road users</li> <li>• Negative Impacts Land acquisition or involuntary resettlement due to the improvement of corner is required</li> </ul>																																											
<p><b>Location of the Project</b></p> <ul style="list-style-type: none"> <li>• Central Monrovia, Sinkor, Old Town, Congo Town, New Kru Town, Logan Town and Paynesville District in Greater Monrovia</li> </ul>																																												
<p><b>Scope of the Project</b></p> <p>Construction of:</p> <ul style="list-style-type: none"> <li>• Expanding carriage way to provide left turn lane</li> <li>• Installation of traffic signal</li> <li>• Provide proper road marking</li> </ul>	<p><b>External Conditions</b></p> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <p><b>Preconditions</b></p> <ul style="list-style-type: none"> <li>• Necessary fund is prepared.</li> </ul>																																											
<p><b>Agencies Responsible</b></p> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Operation : Ministry of Public Works</li> <li>• Maintenance : Ministry of Public Works</li> </ul>	<p><b>Relationship with other projects</b></p> <ul style="list-style-type: none"> <li>• “Somalia Drive Improvement Project” will be cover the improvement of intersections along that road.</li> <li>• “Rehabilitation of Monrovia City Streets Project” will be effective to improve traffic condition inside CBD together with this project.</li> </ul>																																											
<p><b>Estimated Cost</b></p> <ul style="list-style-type: none"> <li>• Construction: <ul style="list-style-type: none"> <li>Intersection: USD 0.70 mln.</li> <li>Traffic Signal: USD 4.60 mln.</li> </ul> </li> <li>• Total Cost: USD 5.30 mln.</li> </ul>																																												
<p><b>Implementation Schedule</b></p> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Design &amp; bid</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Intersection</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>■</td> <td>■</td> </tr> <tr> <td>Signal</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>■</td> </tr> </tbody> </table>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Design & bid											Intersection									■	■	Signal									
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## Project Profile


Project No. and Project Name: TR-6 Bus Terminal & Bus Stop Facilities Construction Project																																												
<b>Background of the Project</b> Taxis are the most popular transport mode in Monrovia at present. But buses shall become the most common public transport to increase person trip and reducing traffic congestion in near future. The facilities for bus service are not yet well-developed. In fact, there is no bus terminal for inter city bus and long distance bus. In addition, the bus stop facilities are very poor. This is one of the reasons why people prefer to use taxis. The lack of bus stops causes disturbance of traffic flow on main lane and facilitates traffic congestion. Therefore, development of facilities for bus services is strongly suggested. Introduction of lay-by for the bus stops will separate stopping bus from main lane to clear the carriageway to avoid choking traffic flow. The introduction of bus terminal creates new users of bus service by enhancing convenient transfer from taxis to buss and vice-versa. The shift of transport mode will promote better public transport, traffic flow and environmental condition.	<b>Effects of the Project</b> Target Beneficiaries : <ul style="list-style-type: none"> <li>• Whole population of Greater Monrovia of about 1 million</li> </ul> Effects: <ul style="list-style-type: none"> <li>• Provision of convenient bus service</li> <li>• Mitigation of traffic congestion</li> <li>• Reduction of energy loss and exhaust fume</li> </ul>																																											
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>• To provide better public transport service</li> <li>• To create movement to shift of transport mode</li> </ul>	<b>Evaluation of the Project</b> Economic Viability <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.                              NPV : USD 0.7 mln                              B/C : 1.21                              EIRR: 28.1%</li> </ul> Financial Soundness <ul style="list-style-type: none"> <li>• Necessary budget allocation</li> </ul> Environmental Impact: <b>Category B</b> <ul style="list-style-type: none"> <li>• Positive Impacts                              Improve public transport service                              Enhance to mitigate CO2 emission gas                              Reduce traffic congestion caused by taxis</li> <li>• Negative Impacts                              Loss of job opportunity for the taxi drivers                              Partial land acquisition adjacent to the bus terminal boundary is assumed</li> </ul>																																											
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>• Whole area in Greater Monrovia</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <b>Preconditions</b> <ul style="list-style-type: none"> <li>• Expand sustainable bus services</li> <li>• Necessary fund is prepared.</li> </ul>																																											
<b>Scope of the Project</b> Construction of: <ul style="list-style-type: none"> <li>• Lay-by for bus stop and shade for waiting passengers, 101 locations</li> <li>• Bus terminal including taxi bay and shopping booth, 3 locations</li> </ul>																																												
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Operation : Ministry of Transport</li> <li>• Maintenance : Ministry of Transport</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>• “Somalia Drive Improvement Project” will be covered the construction of bus stop facilities along the road.</li> </ul>																																											
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>• Construction:                             <table style="margin-left: 20px;"> <tr> <td>Bus Stop:</td> <td>USD 3.20 mln.</td> </tr> <tr> <td>Bus Terminal:</td> <td>USD 1.40 mln.</td> </tr> </table> </li> <li>• Total Cost: USD 4.60 mln.</li> </ul>	Bus Stop:	USD 3.20 mln.	Bus Terminal:	USD 1.40 mln.																																								
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## Project Profile


Project No. and Project Name: TR-7 Traffic Safe Management Project																																												
<b>Background of the Project</b> <p>The number of registered vehicles is increasing year by year in Liberia. Most of these vehicles are operating in Greater Monrovia and the traffic is concentrated on major roads and in the Central Business District (CBD). The Government has implemented improvement and rehabilitation measures for major roads and deteriorated road condition. The running speed of vehicles on the primary roads became higher than before. However, traffic control facilities and safety facilities on the roads, i.e. traffic signal, road marking, road sign, guard fence and so on, are very poor.</p> <p>The increased traffic and heavily congesting road condition enhanced the stress of the road users, and moral &amp; manner of drivers are worsened. Given this situation, the increase in traffic accidents is one of the most important social issues.</p> <p>To solve these problems, a good traffic management is required by the Liberia National Police and Ministry of Public Works. However, their knowledge and experience of management were absent during civil conflict period. Therefore, capacity development of the staffs of related agencies is necessary. Through the training of staffs, execution of proper traffic management, fair enforcement and installation of adequate facilities are expected.</p>	<b>Effects of the Project</b> <b>Target Beneficiaries :</b> <ul style="list-style-type: none"> <li>Counter Part, i.e. Ministry of Public Works, Ministry of Transport &amp; Liberia National Police</li> <li>Whole population of Greater Monrovia of about 1 million</li> </ul> <b>Effects:</b> <ul style="list-style-type: none"> <li>To improve engineering capacity of traffic management</li> <li>To improve education capacity for traffic safety training</li> <li>To improve enforcement ability for traffic regulation &amp; safety instruction</li> </ul>																																											
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>To reinforce the ability to execute regulation of traffic, control of intersection and education of drivers by the agencies.</li> </ul>	<b>Evaluation of the Project</b> <b>Economic Viability</b> <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the transport system for residents, decrease traffic congestion, ensure traffic safety and improve social environment.</li> </ul> <b>Financial Soundness</b> <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul> <b>Environmental Impact</b> <ul style="list-style-type: none"> <li>Positive Impact Improve the traffic safety</li> <li>Negative Impacts Specific negative impact is not found</li> </ul>																																											
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>Whole area in Greater Monrovia</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>Good peace and order is maintained.</li> <li>Counter part agencies for the project have sufficient capacity to get training.</li> </ul> <b>Preconditions</b> <ul style="list-style-type: none"> <li>Necessary fund is prepared.</li> </ul>																																											
<b>Scope of the Project</b> <b>Technical transfer of:</b> <ul style="list-style-type: none"> <li>Traffic control management at intersection</li> <li>Know-how of education for traffic safety and educational activities</li> <li>Regulation of traffic and instruction of traffic safety</li> </ul>																																												
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>Project Implementation : Monrovia City Corporation</li> <li>Counter Part : Ministry of Public Works, Ministry of Transport &amp; Liberia National Police</li> <li>Operation : Ministry of Public Works, Ministry of Transport &amp; Liberia National Police</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>“Intersection Improvement Project” will be implemented by counterpart of this project by using the knowledge and experience.</li> </ul>																																											
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>Project Implementation: USD 2.00 mln.</li> <li>Total Cost: USD 2.00 mln.</li> </ul>																																												
<b>Implementation Schedule</b> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Engineering</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>■</td> <td>■</td> <td>■</td> <td></td> <td></td> </tr> <tr> <td>Enforcement</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>■</td> <td>■</td> <td>■</td> <td></td> <td></td> </tr> <tr> <td>Education</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>■</td> <td></td> <td></td> </tr> </tbody> </table>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Engineering						■	■	■			Enforcement						■	■	■			Education								■	
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Engineering						■	■	■																																				
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## Project Profile

Project No. and Project Name: TR-8 Vai Town Bridge Reconstruction Project																																												
<p><b>Background of the Project</b></p> <p>Vai Town Bridge was the only way linking the city center and the northern suburban areas until 1978 and was an economic life-blood, an asset, and a crucial factor of people's livelihood. Also during the civil conflict, the Bridge allowed the flow of people and goods.</p> <p>In late 2006, the important Vai Town Bridge collapsed. The bridge was operated together with Gabriel Tucker Bridge. These two bridges were the only ways to cross over the Mesurado wetland.</p> <p>Fortunately, Gabriel Tucker Bridge is still in good condition and the access to CBD crossing the wetland is secured. All road users are concentrated on Gabriel Tucker Bridge at present and the Bridge is congested not only by vehicles but also by pedestrians during the whole day time. In particular, a long queue of the vehicles coming from the northern areas is observed during morning peak hours. Original carriageway was 2 lanes for both directions, but the lanes are now divided into 3 lanes, 2 lanes for south direction and 1 lane for north direction, in the morning on weekday. The traffic volume of the bridge is already beyond its capacity.</p> <p>Given this traffic situation, the recovery of original double-bridge operation is urgently required to solve the present heavy traffic congestion. Therefore, reconstruction of Vai Town Bridge is necessary to recover the capital function including economic activities and social environment.</p>	<p><b>Effects of the Project</b></p> <p>Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>• Whole population in Greater Monrovia of about 1 million</li> </ul> <p>Effects:</p> <ul style="list-style-type: none"> <li>• Recovery of original road network around CBD</li> <li>• Mitigation of traffic congestion between CBD and Free Port</li> <li>• Reduction of energy loss and exhaust fume</li> </ul>																																											
<p><b>Objectives of the Project</b></p> <ul style="list-style-type: none"> <li>• To recover the original road network around city center.</li> </ul>	<p><b>Evaluation of the Project</b></p> <p>Economic Viability</p> <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the "without" and "with" case.</li> </ul> <p>NPV : USD 10.5 mln                      B/C : 1.65                      EIRR: 22.8 %</p> <p>•</p> <p>Financial Soundness</p> <ul style="list-style-type: none"> <li>• Committed Grant by World Bank</li> </ul> <p>Environmental Impact</p> <ul style="list-style-type: none"> <li>• Positive Impacts                             <ul style="list-style-type: none"> <li>• Improve travel speed and mitigate CO2 emission gas</li> <li>• Improve accessibility to social/public facilities</li> </ul> </li> <li>• Negative Impacts                             <ul style="list-style-type: none"> <li>• Involuntary resettlement is required in Via Town</li> <li>• Negative impact against Mesurado wetland</li> </ul> </li> </ul>																																											
<p><b>Location of the Project</b></p> <ul style="list-style-type: none"> <li>• Central Monrovia and Clara Town Districts in Greater Monrovia</li> </ul>	<p><b>External Conditions</b></p> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <p><b>Preconditions</b></p> <ul style="list-style-type: none"> <li>• Necessary land is secured.</li> <li>• Construction site can be occupied</li> </ul>																																											
<p><b>Scope of the Project</b></p> <p>Construction of:</p> <ul style="list-style-type: none"> <li>• Demolish debris and existing bridge</li> <li>• 240 m bridge on the same alignment with broken bridge</li> <li>• Approach road on both sides of bridge</li> </ul>	<p><b>Relationship with other projects</b></p> <ul style="list-style-type: none"> <li>• "Johnson Street Bridge Improvement Project" will reinforce the road network around CBD and mitigate traffic congestion.</li> </ul>																																											
<p><b>Agencies Responsible</b></p> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Maintenance : Ministry of Public Works</li> <li>• Operation : Ministry of Public Works</li> </ul>																																												
<p><b>Estimated Cost</b></p> <ul style="list-style-type: none"> <li>• Construction                             <table border="0" style="margin-left: 20px;"> <tr> <td>Bridge :</td> <td>USD 11.50 mln.</td> </tr> <tr> <td>Approach :</td> <td>USD 1.00 mln.</td> </tr> <tr> <td>Demolish of Bridge :</td> <td>USD 2.50 mln.</td> </tr> </table> </li> <li>• Total Cost: USD 15.00 mln.</li> </ul>		Bridge :	USD 11.50 mln.	Approach :	USD 1.00 mln.	Demolish of Bridge :	USD 2.50 mln.																																					
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<p><b>Implementation Schedule</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Sub structure</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Superstructure</td> <td style="background-color: black;"></td> <td style="background-color: black;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Approach Road</td> <td style="background-color: black;"></td> <td style="background-color: black;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Sub structure											Superstructure											Approach Road										
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<p>*Project was commenced in 2009.</p>																																												

## Project Profile

Project No. and Project Name: TR-9 Rehabilitation of Monrovia City Streets Project																																	
<b>Background of the Project</b> <p>During the civil conflict, the Ministry of Public Works lost their capacity to manage its functions. Almost no road maintenance has been carried out from 1986 to 2006. As a result, most roads are in very poor condition even in the Central Business District (CBD) of Monrovia city.</p> <p>Aging pavement in the CBD has many cracks and potholes. The potholes are becoming larger and deeper day by day, especially during rain seasons. Drivers of vehicles drive zigzag beyond center line to avoid such holes on the road. Such road condition gives damage to the vehicles and many old cars suffer troubles frequently.</p> <p>This project will rehabilitate major city streets. Number of streets is 23 sections and total length is close to 24 km, which formulate the city center streets network.</p> <p>The streets basically need asphalt concrete (AC) overlay over improved base course, while in some places there is need to remove present AC, repair the drainage and sewerage pipes and overlay it again. The works will also include major items related to repair of sidewalks, specifically where there are major pedestrian movements.</p>	<b>Effects of the Project</b> <b>Target Beneficiaries :</b> <ul style="list-style-type: none"> <li>• Whole population in Greater Monrovia of about 1 million</li> </ul> <b>Effects:</b> <ul style="list-style-type: none"> <li>• Recovery of city streets network in CBD</li> <li>• Reduction of vehicle repair cost</li> <li>• Improvement of safe and convenience of pedestrians</li> <li>• Reduction of energy loss and exhaust fume</li> </ul>																																
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>• To provide the city streets network in good condition</li> </ul>	<b>Evaluation of the Project</b> <b>Economic Viability</b> <ul style="list-style-type: none"> <li>• Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.</li> <li>NPV : USD 33.7 mln</li> <li>B/C : 2.48</li> <li>EIRR: 26.7 %</li> </ul> <b>Financial Soundness</b> <ul style="list-style-type: none"> <li>• Committed Grant by World Bank</li> </ul> <b>Environmental Impacts</b> <ul style="list-style-type: none"> <li>• Positive Impacts <ul style="list-style-type: none"> <li>Improve travel speed and mitigate CO2 emission gas</li> <li>Improve accessibility to social/public facilities</li> <li>Enhance economic activity</li> </ul> </li> <li>• Negative Impacts <ul style="list-style-type: none"> <li>Specific negative impact is not found.</li> </ul> </li> </ul>																																
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>• Central Monrovia in Greater Monrovia</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>• Good peace and order is maintained.</li> <li>• Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <b>Preconditions</b> <ul style="list-style-type: none"> <li>• Traffic control and temporal regulation shall be approved.</li> </ul>																																
<b>Scope of the Project</b> <b>Construction of:</b> <ul style="list-style-type: none"> <li>• Rehabilitation of 23 streets in city center</li> <li>• Repair of buried pipes</li> <li>• Repair of sidewalks</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>• “Johnson Street Bridge Improvement Project” and “Vai Town Bridge Reconstruction Project” will bring larger traffic to CBD.</li> </ul>																																
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>• Project Implementation : Ministry of Public Works</li> <li>• Maintenance : Ministry of Public Works</li> <li>• Operation : Ministry of Public Works</li> </ul>																																	
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>• Construction USD 16.00 mln.</li> <li>• Consulting Service: USD 1.60 mln.</li> <li>• Total Cost: USD 17.60 mln.</li> </ul>																																	
<b>Implementation Schedule</b> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Construction</td> <td>■</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Consulting</td> <td>■</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>*Project was commenced in 2009.</p>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Construction	■										Consulting	■								
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019																							
Construction	■																																
Consulting	■																																

## Project Profile

Project No. and Project Name: TR-10 Caldwell Bridge Construction Project																																	
<b>Background of the Project</b> Caldwell bridge is located on the Caldwell Road and crosses the Stockton Creek. Although the Caldwell Road has wide carriageway for each direction, the bridge does not have enough width to provide 2 lanes. Therefore, single lane operation is insufficient. Vehicles are enforced to wait at the foot of the bridge until the vehicles passing from the opposite side are cleared from the bridge. In addition, the bridge has a similar structure as the collapsed Vai Town Bridge, that is the capacity of traffic load may be smaller than the expected vehicle load. The steel members are rusted and may be dilapidated, and hence collapse may occur in the near future. Given this situation, the existing bridge, about 120 m long, has been closed by the government for heavy vehicles i.e. trucks and heavy equipment, and only light vehicles, pedestrians and bicycle are allowed to use the bridge. The bridge connects two major sections of Monrovia City and its closure presents a major disturbance to the trade and commerce in this area of the City A tentative identification of the candidate location of the bridge has been already selected among several alternatives and is close to the existing bridge. The new bridge will also require a new alignment for the bridge approach, each of about 300 to 500 m long.	<b>Effects of the Project</b> <b>Target Beneficiaries :</b> <ul style="list-style-type: none"> <li>Population of Caldwell , Barnesville and Johnsonville Zones of about 66 thousand</li> </ul> <b>Effects:</b> <ul style="list-style-type: none"> <li>To ensure permanent road service at Caldwell Bridge</li> <li>To secure social and economic activities</li> </ul>																																
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>To secure traffic crossing across Stockton Creek on Caldwell Road</li> </ul>	<b>Evaluation of the Project</b> <b>Economic Viability</b> <ul style="list-style-type: none"> <li>Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.                          NPV : USD 9.8 mln                          B/C : 2.58                          EIRR: 24.8 %</li> </ul> <b>Financial Soundness</b> <ul style="list-style-type: none"> <li>Committed Grant by World Bank</li> </ul> <b>Environmental Impacts</b> <ul style="list-style-type: none"> <li>Positive Impacts                          Improve the living standard of residents                          Improvement of accessibility to social/public facilities for residents</li> <li>Negative Impacts                          Land acquisition and involuntary resettlement are necessary at the new approach road.</li> </ul>																																
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>Caldwell District in Greater Monrovia</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>Good peace and order is maintained.</li> <li>Responsible agency for operation and maintenance has sufficient capacity.</li> </ul> <b>Preconditions</b> <ul style="list-style-type: none"> <li>Land for the construction shall be secured.</li> <li>Resettlement shall be completed.</li> </ul>																																
<b>Scope of the Project</b> Construction of: <ul style="list-style-type: none"> <li>New bridge crossing Stockton Creek</li> <li>New approach road on both sides of bridge</li> </ul>																																	
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>Project Implementation : Ministry of Public Works</li> <li>Maintenance : Ministry of Public Works</li> <li>Operation : Ministry of Public Works</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>“Road Rehabilitation Project” will improve Caldwell Road and connecting several roads to develop the road network around this area.</li> </ul>																																
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>Construction <span style="float: right;">USD 6.00 mln.</span></li> <li>Consulting Service: <span style="float: right;">USD 1.00 mln.</span></li> <li>Total Cost: <span style="float: right;">USD 7.00 mln.</span></li> </ul>																																	
<b>Implementation Schedule</b> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Construction</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Consulting</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Construction											Consulting									
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## Project Profile

Project No. and Project Name: WS-1 Monrovia Water and Sanitation Rehabilitation Program (WSRP)																								
Background of the Project	Effects of the Project																							
<p>The existing water supply facilities in Greater Monrovia were damaged and the associated equipments were stolen by thieves, and therefore the facilities have become inoperative. Whereas, the White Plains purification treatment plant was constructed in 1966 and 1982, and the rising and distribution facilities were laid from 1950 to 1970 so that some parts of facilities have been deteriorated.</p> <p>Based on this background, in order to urgently recover the function of the existing water supply facilities, LWSC has been carrying out this project since 2008.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 750,000 inhabitants in Greater Monrovia</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of quality of life</li> <li>Promotion of work activities</li> </ul>																							
	Objectives of the Project	Evaluation of the Project																						
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>NPV : USD 90.0 mln</li> <li>B/C : 2.51</li> <li>EIRR : 36.0%</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Committed by WB, EU, DIFID, AfDB</li> </ul> <p>Environmental Impact:</p> <ul style="list-style-type: none"> <li>Positive Impacts                             <ul style="list-style-type: none"> <li>Improve hygiene service and living standard</li> </ul> </li> <li>Negative Impacts                             <ul style="list-style-type: none"> <li>Specific negative impact is not found</li> </ul> </li> </ul>																							
Location of the Project	External Conditions																							
<ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>																								
Scope of the Project	Preconditions																							
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Rehabilitation of intake pumps</li> <li>Rehabilitation of the White Plains treatment plant (especially, replacement of mechanical equipments)</li> <li>Rehabilitation of booster pump stations</li> <li>Rehabilitation of rising main and distribution pipelines</li> <li>Cleaning of two (2) service reservoirs</li> <li>Procurement of generators in the White Plains treatment plant</li> </ul>																								
Agencies Responsible	Relationship with other projects																							
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: LWSC</li> <li>Maintenance: LWSC</li> </ul>	<ul style="list-style-type: none"> <li>There are five (5) projects for supplying safe and stable water to Greater Monrovia. This project is one of them for the year of 2011.</li> </ul>																							
Estimated Cost	Remarks																							
<ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 38.50 mln.</li> <li>Total Cost : USD 38.50 mln.</li> </ul>																								
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<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>WSRP</td> <td>4.75</td> <td>9.75</td> <td>24.00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Unit: mln USD</p>		Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	WSRP	4.75	9.75	24.00							
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019													
WSRP	4.75	9.75	24.00																					


## Project Profile

Project No. and Project Name: WS-2 Monrovia Expansion and Rehabilitation of Three County Capitals (ERTC)																									
Background of the Project	Effects of the Project																								
<p>The capacity of the existing White Plains Water Supply System will be restored to be about 16MGD (60,000m<sup>3</sup>/day) by 2011 through Monrovia Water and Sewer Rehabilitation Program (WSRP), which is currently being conducted by the funding of W.B., AfDB and other donors. However, water production is about 3MGD (11,000m<sup>3</sup>/day) short of the estimated water demand for overall Greater Monrovia in 2014. Water shortage in Paynesville especially becomes a serious problem, as Paynesville is predicted to be developed as residential areas based on the urban planning in this Master Plan Study without a distribution network except for the pipelines along trunk road. Accordingly, water supply system utilizing rich groundwater which does not depend on the White Plains water supply system is urgently required in Paynesville zone.</p> <p>LWSC commenced a study with the fund of AfDB targeting four (4) communities in the northern parts of Paynesville zone in 2009.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 70,000 inhabitants in Paynesville zone</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of quality of life</li> <li>Promotion of work activities</li> </ul>																								
Objectives of the Project	Evaluation of the Project																								
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>NPV : USD 1.3mln</li> <li>B/C : 0.92</li> <li>EIRR : 8.9%</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Committed by AfDB</li> </ul> <p>Environmental Impact:</p> <ul style="list-style-type: none"> <li>Positive Impacts Improve hygiene service and living standard</li> <li>Negative Impacts Alternative well site must be provided when the considerable decrease of groundwater level is serious</li> </ul>																								
Location of the Project																									
<ul style="list-style-type: none"> <li>Paynesville Zone</li> </ul>																									
Scope of the Project	External Conditions																								
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Construction of 85 boreholes with about 60 submersible pumps and generators (20-30kVA)</li> <li>Construction of 35 elevated water tanks with a capacity of 70m<sup>3</sup></li> <li>Laying of rising pipelines from boreholes to service reservoirs and distribution pipelines from service reservoirs to public taps and households (PVC/GS, 100-200mm x 120km)</li> <li>Installation of about 230 taps (6 faucets per tap)</li> </ul>	<ul style="list-style-type: none"> <li>O&amp;M cost of the water supply system shall be covered by beneficiaries.</li> <li>Land acquisition for boreholes and service reservoirs (elevated water tanks)</li> <li>Initial fund shall be established in water committees.</li> </ul>																								
Agencies Responsible	Preconditions																								
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: Communities to be served</li> <li>Maintenance: LWSC and communities to be served</li> </ul>	<ul style="list-style-type: none"> <li>Responsible organizations such as LWSC and water committees of served communities have sufficient capabilities for operating and maintaining water supply system.</li> <li>Good peace and order is maintained.</li> </ul>																								
Estimated Cost	Relationship with other projects																								
<ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 16.28 mln.</li> <li>Contingency: USD 2.96 mln.</li> <li>Total Cost : USD 19.24 mln.</li> </ul>	<ul style="list-style-type: none"> <li>There are five (5) projects for supplying safe and stable water to Greater Monrovia. This project is one of them but focuses on Paynesville zone for the year of 2014.</li> </ul>																								
Implementation Schedule	Remarks																								
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>ERTC</td> <td>3.00</td> <td>8.12</td> <td>8.12</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Unit: mln USD</p>	Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	ERTC	3.00	8.12	8.12									<p>○ : Project Area</p>
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019														
ERTC	3.00	8.12	8.12																						

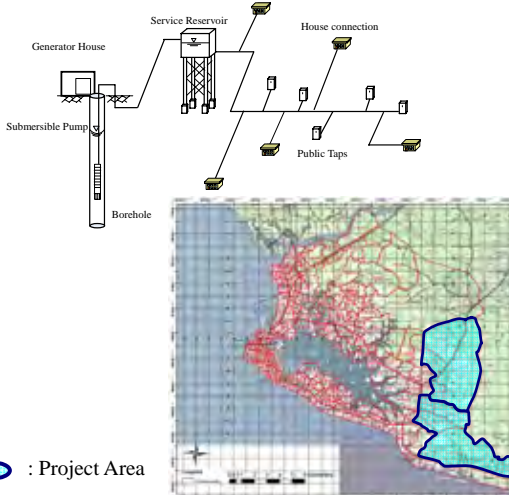
## Project Profile

Project No. and Project Name: WS-3 Project for Emergency Development of Water Supply System at Paynesville in Greater Monrovia (PEDW)																								
Background of the Project	Effects of the Project																							
<p>The capacity of the existing White Plains Water Supply System will be restored to be about 16MGD (60,000m<sup>3</sup>/day) by 2011 through Monrovia Water and Sewer Rehabilitation Program (WSRP), which is currently being conducted by the funding of W.B., AfDB and other donors. However, water production is about 3MGD (11,000m<sup>3</sup>/day) short of the estimated water demand for overall Greater Monrovia in 2014. However, water production is about 3MGD (11,000m<sup>3</sup>/day) short of the estimated water demand for overall Greater Monrovia in 2014. Water shortage in Paynesville especially becomes a serious problem, as Paynesville is predicted to be developed as residential areas based on the urban planning in this Master Plan Study without a distribution network except for the pipelines along trunk road. Accordingly, development of water supply system utilizing rich groundwater which does not depend on the White Plains water supply system is urgently required in Paynesville zone. LWSC made a request to Japanese side for developing water supply system targeting five (5) communities in South parts of Paynesville zone in 2009.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 60,000 inhabitants in Paynesville zone</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of quality of life</li> <li>Promotion of work activities</li> </ul>																							
Objectives of the Project	Evaluation of the Project																							
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>NPV : USD 1.3 mln</li> <li>B/C : 0.90</li> <li>EIRR : 8.4%</li> <li>FIRR : 3.33%</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Requested Japan's Grant Aid</li> </ul> <p>Environmental Impact: <b>Category B</b></p> <ul style="list-style-type: none"> <li>Positive Impacts Improve hygiene service and living standard</li> <li>Negative Impacts Alternative well site must be provided when the considerable decrease of groundwater level is serious</li> </ul>																							
Location of the Project	External Conditions																							
<ul style="list-style-type: none"> <li>Paynesville Zone</li> </ul>	<ul style="list-style-type: none"> <li>O&amp;M cost of the water supply system shall be covered by beneficiaries.</li> <li>Land acquisition for boreholes and service reservoirs (elevated water tanks)</li> <li>Initial fund shall be established in water committees.</li> </ul>																							
Scope of the Project	Preconditions																							
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Construction of 73 boreholes with about 50 submersible pumps and generators (20-30kVA)</li> <li>Construction of 26 ground service reservoirs and two (2) elevated water tanks</li> <li>Laying of rising pipelines from boreholes to service reservoirs and distribution pipelines from service reservoirs to public taps and households (PVC/GS, 100-200mm x 100km)</li> <li>Installation of about 200 taps (6 faucets per tap)</li> </ul>	<ul style="list-style-type: none"> <li>Responsible organizations such as LWSC and water committees of served communities have sufficient capabilities for operating and maintaining water supply system.</li> <li>Good peace and order is maintained.</li> </ul>																							
Agencies Responsible	Relationship with other projects																							
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: Communities to be served</li> <li>Maintenance: LWSC and communities to be served</li> </ul>	<ul style="list-style-type: none"> <li>There are five (5) projects for supplying safe and stable water to Greater Monrovia. This project is one of them but focuses on Paynesville zone for the year of 2014.</li> </ul>																							
Estimated Cost	Remarks																							
<ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 14.00 mln.</li> <li>Contingency: USD 2.50 mln.</li> <li>Capacity building: USD 0.10 mln.</li> <li>Total Cost : USD 16.60 mln.</li> </ul>	<p>○ : Project Area</p>																							
Implementation Schedule																								
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>PEDW</td> <td></td> <td>2.50</td> <td>7.10</td> <td>7.00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Unit: mln USD</p>	Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	PEDW		2.50	7.10	7.00							
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019													
PEDW		2.50	7.10	7.00																				

## Project Profile

Project No. and Project Name: WS-4 Expansion Project of White Plains Water Supply System (EPWS)																									
Background of the Project	Effects of the Project																								
<p>The capacity of the existing White Plains Water Supply System will be restored to be about 16MGD (60,000m<sup>3</sup>/day) by 2011 through Monrovia Water and Sewer Rehabilitation Program (WSRP), which is currently being conducted by the funding of WB., AfDB and other donors.</p> <p>In addition, in order to supply water of about 2.4 MGD (9,000m<sup>3</sup>/day) to about 70% of the total population of Paynesville zone with the highest population out of Greater Monrovia zones, two projects such as Monrovia Expansion and Rehabilitation of Three County Capitals (ERTC) and Project for Emergency Development of Water Supply System in Paynesville in Greater Monrovia (PEDW) have been planned for the target year of 2014. However, even if ERTC and PEDW are implemented as scheduled for the year of 2014, water production is about 12MGD (45,000m<sup>3</sup>/day) short of the estimated water demand for overall Greater Monrovia in 2019. Since the amount of was for the un-served dwellers of Paynesville zone accounts for about 2.0MGD (7,500m<sup>3</sup>/day) out of 12MGD of water demand for the total population of the zone., development of the satellite water supply system like PEDW and ERTC utilizing groundwater shall be considered for supplying water of 2.0MGD to Paynesville zone for the year of 2019.</p> <p>Accordingly, water production for the balance of 10MGD (38,000m<sup>3</sup>/day) is required for covering future water demand through the expansion of the capacity of the White Plains water supply system. At the same time, in order to supply stable water, isolation of the existing service area is required with more service reservoirs in addition to the existing service reservoirs.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 1.1million inhabitants in Greater Monrovia</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of quality of life</li> <li>Promotion of work activities</li> </ul>																								
Objectives of the Project	Evaluation of the Project																								
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>NPV : USD 103.3 mln</li> <li>B/C : 1.97</li> <li>EIRR : 21.3%</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Necessary the budget allocation</li> </ul> <p>Environmental Impact: <b>Category B</b></p> <ul style="list-style-type: none"> <li>Positive Impacts                             <ul style="list-style-type: none"> <li>Improve hygiene service and living standard</li> </ul> </li> <li>Negative Impacts                             <ul style="list-style-type: none"> <li>Land acquisition for the new service station will be required</li> </ul> </li> </ul>																								
Location of the Project	External Conditions																								
<ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>	<ul style="list-style-type: none"> <li>O&amp;M cost of the water supply system shall be covered by beneficiaries.</li> <li>Land acquisition for service reservoirs is required.</li> </ul>																								
Scope of the Project	Preconditions																								
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Expansion of the White Plains treatment plant and intake (Max. capacity: 32MGD)</li> <li>Expansion of rising main pipelines of 500-800mm (about 44.0km)</li> <li>Expansion of six (6) ground service reservoirs (Capacity: 800-8,500m<sup>3</sup>) and seven (7) elevated storage tanks (Capacity: 1,000-1,500m<sup>3</sup>)</li> <li>Expansion of centrifugal surface pumps of 3MGD x 4sets and 4MGD 2sets, and generators (2,500kVA)</li> <li>Expansion of distribution main pipelines of 40-600mm (about 215km)</li> </ul>	<ul style="list-style-type: none"> <li>Responsible organizations such as LWSC and water committees of served communities have sufficient capabilities for operating and maintaining water supply system.</li> <li>Intentional budgetary arrangements for construction are required annually.</li> <li>Good peace and order is maintained.</li> </ul>																								
Agencies Responsible	Relationship with other projects																								
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: LWSC</li> <li>Maintenance: LWSC</li> </ul>	<ul style="list-style-type: none"> <li>There are five (5) projects for supplying safe and stable water to Greater Monrovia. This project is one of them for the year of 2019.</li> </ul>																								
Estimated Cost	Remarks																								
<ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 98.94 mln.</li> <li>Contingency: USD 29.68 mln.</li> <li>Total Cost : USD 128.62 mln.</li> </ul>	<p>The following areas are exclusive of this project area.</p> 																								
Implementation Schedule																									
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>EPWS</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>17.09</td> <td>17.09</td> <td>25.17</td> <td>22.66</td> <td>22.67</td> <td>15.87</td> <td>8.08</td> </tr> </tbody> </table> <p>Unit: mln USD</p>	Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	EPWS	-	-	-	-	17.09	17.09	25.17	22.66	22.67	15.87	8.08	
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019														
EPWS	-	-	-	-	17.09	17.09	25.17	22.66	22.67	15.87	8.08														

## Project Profile

Project No. and Project Name: WS-5 Project for Expansion of Water Supply System at Paynesville in Greater Monrovia (PEWS) Phase II																									
Background of the Project	Effects of the Project																								
In order to supply water of about 2.4 MGD (9,000m <sup>3</sup> /day) to about 70% of the total population of Paynesville zone with the highest population out of Greater Monrovia zones, two (2) projects such as Monrovia Expansion and Rehabilitation of Three County Capitals (ERTC), and Project for Emergency Development of Water Supply System in Paynesville in Greater Monrovia (PEDW) have been planned for the year of 2014. Further water production of about 1.9MGD (7,000m <sup>3</sup> /day) is required for covering all the population in Paynesville zone for the year of 2019. Out of 1.9MGD, it is proposed that water production of about 1.4MGD (5,200m <sup>3</sup> /day) is covered by this project, while about 0.5MGD (1,800m <sup>3</sup> /day) is covered by the CM-1 Community Infrastructure Reconstruction Project. Paynesville zone has also the largest area in Greater Monrovia, but water pipelines have not been developed yet in most of areas. Therefore, even if sufficient water is produced from Saint Paul river, which is currently being utilized through the White Plains water supply system, it will take time to lay the rising main and distribution pipelines in Paynesville zone. Accordingly, development of water supply system utilizing rich groundwater which does not depend on the White Plains water supply system is urgently required, in Paynesville zone for the year of 2019.	a) Target Beneficiaries : • About 80,000 inhabitants in Paynesville zone  b) Effects of the Project : • Reduction of water-borne disease • Improvement of the quality of life • Promotion of work activities																								
Objectives of the Project	Evaluation of the Project																								
• To raise the living standard of the residents. • To improve environmental hygiene of residents.	Economic Viability: • NPV : USD 5.1 mln B/C : 0.76 EIRR : 7.5%  Financial Soundness: • Necessary budget allocation Environmental Impact: <b>Category B</b> • Positive Impacts Improve hygiene service and living standard • Negative Impacts Alternative well site must be provided when the considerable decrease of groundwater level is serious																								
Location of the Project	External Conditions																								
• Paynesville Zone	• O&M cost of the water supply system shall be covered by beneficiaries. • Land acquisition for boreholes and service reservoirs (elevated water tanks) • Initial fund shall be established in water committees.																								
Scope of the Project	Preconditions																								
The project includes the following items : • Construction of 100 boreholes with about 70 submersible pumps and generators (20-30kVA) • Construction of 40 elevated water tanks with a capacity of 70m <sup>3</sup> • Laying of rising pipelines from boreholes to service reservoirs and distribution pipelines from service reservoirs to public taps and households (PVC/GS, 100-200mm x 140km) • Installation of about 290 taps (6 faucets per tap)	• Responsible organizations such as LWSC and water committees of served communities have sufficient capabilities for operating and maintaining water supply system. • Good peace and order is maintained.																								
Agencies Responsible	Relationship with other projects																								
• Project Implementation: Liberia Water and Sanitation Corporation (LWSC) • Operation: Communities to be served • Maintenance: LWSC and communities to be served	• Water service coverage of Paynesville zone shall be improved to 100% in 2019 by this project after implementation of 'Monrovia Expansion and Rehabilitation of Three County Capitals (ERTC)' and 'Project for Emergency Development of Water Supply System in Paynesville in Greater Monrovia (PEDWW)', which were targeted for 2014.																								
Estimated Cost	Remarks																								
• Implementation/Construction Cost (including design, construction supervision cost) : USD 19.35 mln. • Contingency: USD 3.52 mln. • Total Cost : USD 22.87 mln.																									
Implementation Schedule																									
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>PEWS (Phase II)</td> <td></td> <td></td> <td></td> <td>2.5</td> <td>8.14</td> <td>5.64</td> <td>5.64</td> <td>5.64</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	PEWS (Phase II)				2.5	8.14	5.64	5.64	5.64				
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019														
PEWS (Phase II)				2.5	8.14	5.64	5.64	5.64																	
Unit: mln USD																									



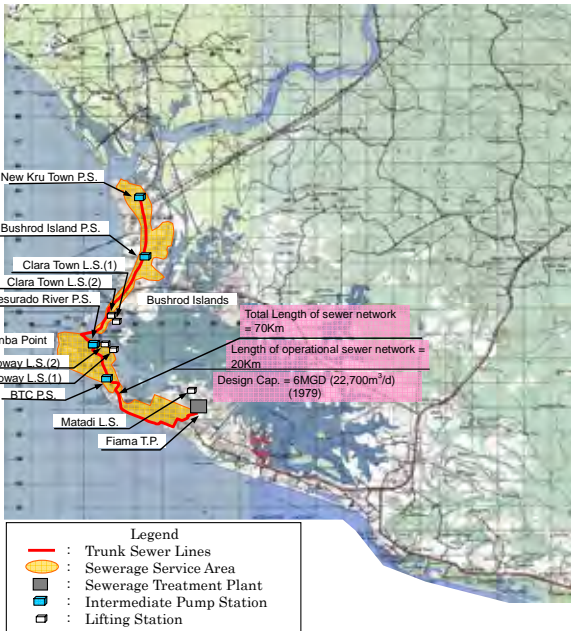
## Project Profile

Project No. and Project Name: WS-6 Technical Cooperation Project of Groundwater Management (TCPGM)																									
Background of the Project	Effects of the Project																								
<p>Conventionally, shallow and dug wells have been used by the dwellers in Greater Monrovia as an alternative water source of the White Plains water supply system. Most of such wells were developed for residential purpose as an emergency measures during the civil conflict or later on. However, their wells are not registered or monitored by LWSC and MLME, due to lack of registration system. Therefore, well conditions such as water quality, water production yield, groundwater level, etc. have not been verified by responsible organizations such as LWSC and MLME.</p> <p>For the future, since development of public water supply system such as Monrovia Expansion and Rehabilitation of Three County Capitals (ERTC), Project for Emergency Development of Water Supply System in Paynesville in Greater Monrovia (PEDW), and Project for Expansion of Water Supply System at Paynesville in Greater Monrovia (PEWS) are planned, groundwater management is crucial to sustain the performance of the wells appropriately.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 1.5million inhabitants (for the target year of 2019) in Paynesville zone</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of the quality of life</li> <li>Improvement on technical management of LWSC and MLME</li> </ul>																								
Objectives of the Project	Evaluation of the Project																								
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> <li>To enhance capabilities of operation &amp; maintenance in responsible organization</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the groundwater system and environmental hygiene for citizens.</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul>																								
Location of the Project	External Conditions																								
<ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>	<ul style="list-style-type: none"> <li>LWSC has fundamental capability for operating and maintaining water supply system.</li> </ul>																								
Scope of the Project	Preconditions																								
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Training on the regular monitoring of static water level of boreholes and its evaluation measurements.</li> <li>Training on a regular analysis of water quality such as pH, total E-Coli, Turbidity, Color, EC, etc., and its evaluation measurements.</li> <li>Training on an establishment of rules and regulations on registration required for developing groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Staff of the technical, operation division of LWSC and hydrogeology division of MLME is required to be involved in the project.</li> <li>Good peace and order is maintained.</li> </ul>																								
Agencies Responsible	Relationship with other projects																								
<p>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)                  Ministry of Land, Mines and Energy (MLME)</p>	<ul style="list-style-type: none"> <li>In order to sustain public water supply system, which might be developed through Monrovia Expansion and Rehabilitation of Three County Capitals (ERTC), and the Project for Emergency Development of Water Supply System at Paynesville in Greater Monrovia (PEDWW), these projects shall be followed up by this technical cooperation.</li> </ul>																								
Estimated Cost	Remarks																								
<ul style="list-style-type: none"> <li>Technical cooperation for groundwater and water quality control: USD 0.20 mln.</li> <li>Water quality analysis equipments, operating expenses, etc: USD 0.12 mln.</li> <li>Total Cost : USD 0.32 mln.</li> </ul>																									
Implementation Schedule																									
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>TCPGM</td> <td>---</td> <td>---</td> <td>---</td> <td>0.10</td> <td>0.11</td> <td>0.11</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	TCPGM	---	---	---	0.10	0.11	0.11	---	---	---	---	---	
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019														
TCPGM	---	---	---	0.10	0.11	0.11	---	---	---	---	---														
Unit: mln USD																									


## Project Profile

Project No. and Project Name: WS-7 Technical Cooperation Project of Non-Revenue Water (TCPNR)																									
Background of the Project	Effects of the Project																								
<p>LWSC has faced serious problems on large amount of non-revenue water which has been caused by leakage on the existing pipelines of the White Plains water supply system, defection on water tariff system, faulty meters, etc. Hence, that the rate of revenue water in 2008 was extremely at low level of about 19%.</p> <p>Through Monrovia Water and Sewer Rehabilitation Program (WSRP) which is currently being conducted by the fund of WB., AfDB and other donors, water leakage is expected to reduce. In addition, water tariff system is inadequate for sustaining financial management, as there are no water meters and/or even if there are water meters, they are inoperative. Therefore, non-revenue water is assumed to come from the gap between flat water rate and actual water consumption as well as water leakage. In order to sustain sound management of LWSC, countermeasures such as leakage detection, improving water tariff system, etc. are required for non-revenue water reduction.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 1.5million inhabitants (for the target year of 2019) in Greater Monrovia</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of quality of life</li> <li>Sound management of LWSC</li> <li>Contribution for formulating the future water supply rehabilitation plan</li> </ul>																								
Objectives of the Project	Evaluation of the Project																								
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> <li>To enhance capabilities of operation &amp; maintenance in responsible organization</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the groundwater system for citizens and environmental hygiene.</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul>																								
Location of the Project	External Conditions																								
<ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>																									
Scope of the Project	Preconditions																								
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Analysis of current situation such as water production, distribution water, non-revenue water</li> <li>Verification on location of the existing network pipelines</li> <li>Select pilot project.</li> <li>Digitize network pipelines in pilot plot project area using GIS software.</li> <li>Site reconnaissance for checking network pipelines.</li> <li>Check installation condition of the existing water meters in pilot project area.</li> <li>Check the minimum water flow at night in pilot project area.</li> <li>Carry out leakage detection in pilot project area</li> <li>Repair leakage points in pilot project area.</li> <li>Check minimum water flow at night in pilot project area after repair of leakage points.</li> <li>Improve water tariff system</li> </ul>																									
Agencies Responsible	Relationship with other projects																								
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> </ul>	<ul style="list-style-type: none"> <li>After completion of Monrovia Water and Sanitation Rehabilitation Program (WSRP), it is important for LWSC to examine the effect of the rehabilitation program through this project.</li> <li>As the results of examination, some problems have to be issued and taken into consideration for making the future water supply improvement plan</li> </ul>																								
Estimated Cost	Remarks																								
<ul style="list-style-type: none"> <li>Technical cooperation for non-revenue reduction program, leakage detection ,management of water production and distribution water: USD 0.60 mil.</li> <li>Equipments such as ultrasonic flow meter, ground detector, leakage detector, etc and operating expenses: USD 0.90 mln.</li> <li>Total Cost : USD 1.50 mln.</li> </ul>																									
Implementation Schedule																									
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>TCPNR</td> <td></td> <td></td> <td></td> <td>0.50</td> <td>0.50</td> <td>0.50</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Unit: mln USD</p>	Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	TCPNR				0.50	0.50	0.50						
Project	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019														
TCPNR				0.50	0.50	0.50																			


## Project Profile

Project No. and Project Name: SN-1 Monrovia Water and Sanitation Rehabilitation Program (WSRP)																	
<b>Background of the Project</b> The existing sewerage treatment plant with sludge lagoon constructed in 1979 is located in the wetland in the southern part of Greater Monrovia. Not only wastewater of households which is connected to sewer system, but also night soil drawn by vacuum tracks from other households that cannot use sewer system has been discharged into the sewerage treatment plant. However, the operation of sewerage treatment plant has been suspended for a long period and the wastewater and night soil have flown into the stabilization pond without any treatment. The channel for discharging night soil is small hand trench which is dug in cultivation land. The content of rehabilitation work, in order to facilitate a disposal of night soil discharged from vacuum tracks is restoration for the inlet of the stabilization pond of 26,000m <sup>2</sup> as immediate rehabilitation of the sewerage plant.  In addition, the rehabilitation programs are composed of construction of 11 public toilets, rehabilitation of 30 existing public toilets, procurements of maintenance equipments such as vacuum tracks and jet cleaning vehicles.	<b>Effects of the Project</b> a) Target Beneficiaries : • About 280,000 inhabitants in Bushrod Islands, Central Monrovia  b) Effects of the Project : • Reduction of water-borne disease • Improvement of the quality of life • Promotion of work activities  <b>Evaluation of the Project</b>  Economic Viability: • NPV : USD 90.0 mln B/C : 2.51 EIRR : 36.0%  Financial Soundness: • Committed by WB, EU, DIFID, AfDB  Environmental Impact: • Positive Impacts Improve the hygiene service and living standard • Negative Impacts Specific negative impact is not found																
<b>Objectives of the Project</b> • To raise the living standard of the residents. • To improve environmental hygiene of residents.	<b>Preconditions</b> • O&M cost of the sewerage treatment system shall be covered by beneficiaries.																
<b>Location of the Project</b> • Central Monrovia	<b>Relationship with other projects</b> • There are five (5) projects for sewerage and sanitary system for Greater Monrovia. This project is one of them for the year of 2011.																
<b>Scope of the Project</b> The project includes the following items : • Construction of receptacle for septage • Rehabilitation of screen channel with use of new pipe connection to link facultative pond • Rehabilitation of ponds for sewage and septage • Interconnection pipe work	<b>Remarks</b> 																
<b>Agencies Responsible</b> • Project Implementation: Liberia Water and Sanitation Corporation (LWSC) • Operation: LWSC • Maintenance: LWSC																	
<b>Estimated Cost</b> • Implementation/Construction Cost (including design, construction supervision cost) : USD 2.9 mln. • Total Cost : USD 2.9 mln.																	
<b>Implementation Schedule</b> <table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td>NO.1</td> <td>0.96</td> <td>0.96</td> <td>0.98</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Project	2009	2010	2011	2012	2013	2014	2015	NO.1	0.96	0.96	0.98					
Project	2009	2010	2011	2012	2013	2014	2015										
NO.1	0.96	0.96	0.98														
Unit: mln USD																	

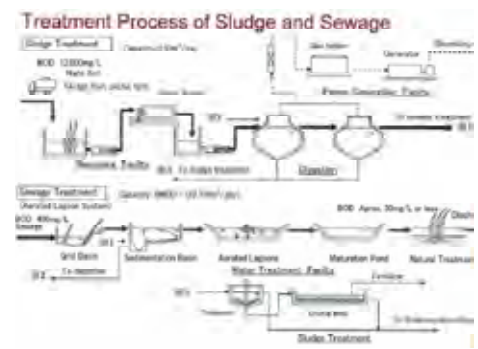
## Project Profile

Project No. and Project Name: SN-2 Urban Infrastructure Construction and Rehabilitation of Monrovia Sewerage Network Pumping Stations																
Background of the Project	Effects of the Project															
<p>The existing sewerage facilities were constructed in the 1950s and late 1960s. The sewer pipes were mainly laid in Bushrod Islands (New Kru Town, Logan Town, Clara Town), Central Monrovia, Sinkor and Old Road.</p> <p>Sewage generated from each area was transmitted through 4 pump stations of the New Kru Town (Duala) pump station, the Bushrod Island (Sayon Town ) pump station (Sayon town pump station), Mesurado River pump station and BTC pump station, and finally treated in the Fiama sewerage treatment plant (Design Capacity: 6MGD/day) located at Sinkor.</p> <p>However, most of the pump stations in the sewerage system have been seriously damaged and are not operative at present, because the pumps in four intermediate pump stations as mentioned above were stolen during the civil conflict. Then, most of the sewer pipes are blocked with sludge and debris.</p> <p>Accordingly, rehabilitation of the existing sewerage facilities such as 4 pump stations including 5 small size lifting stations and also de-sludge and cleaning the clogged pipelines is urgently required. SIU of MPW and LWSC commenced a study with the fund of WB to analyze the situations mentioned above.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>• About 280,000 inhabitants in Paynesville zone</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>• Reduction of water-borne disease</li> <li>• Improvement of quality of life</li> <li>• Promotion of work activities</li> </ul>															
	Evaluation of the Project															
	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>• NPV : USD 10.3 mln</li> <li>• B/C : 2.53</li> <li>• EIRR : 28.4%</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>• Committed by WB</li> </ul> <p>Environmental Impact:</p> <ul style="list-style-type: none"> <li>• Positive Impacts Improve hygiene service and living standard</li> <li>• Negative Impacts Possible resettlement at pumping stations where illegally occupied by vendors and kiosks</li> </ul>															
	External Conditions															
	<ul style="list-style-type: none"> <li>• LWSC have sufficient capabilities for operating and maintaining the sewerage treatment system</li> </ul>															
	Preconditions															
	<ul style="list-style-type: none"> <li>• O&amp;M cost of the sewerage facilities shall be covered by beneficiaries.</li> </ul>															
Objectives of the Project	Relationship with other projects															
<ul style="list-style-type: none"> <li>• To raise the living standard of the residents.</li> <li>• To improve environmental hygiene of residents.</li> </ul>	<ul style="list-style-type: none"> <li>• There are five (5) projects for sewerage and sanitary system for Greater Monrovia. This project is one of them for the year of 2011.</li> </ul>															
Location of the Project	Remarks															
<ul style="list-style-type: none"> <li>• Paynesville Zone</li> </ul>																
Scope of the Project																
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>• De-sludge, cleaning and rehabilitation of the existing clogged pipeline in Bushrod Islands (New Kru Town, Logan Town), Central Monrovia, Sinkor and Old Road areas.</li> <li>• Rehabilitation of 4 pump stations of the New Kru Town (Duala) pump station, the Bushrod Island (Sayon Town ) pump station (Sayon town pump station), Mesurado River pump station and BTC pump station including 5 small lifting stations.</li> </ul>																
Agencies Responsible																
<ul style="list-style-type: none"> <li>• Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>• Operation: Communities to be served</li> <li>• Maintenance: LWSC and communities to be served</li> </ul>																
Estimated Cost																
<ul style="list-style-type: none"> <li>• Implementation/Construction Cost (including design, construction supervision cost) : USD 4.1 mln.</li> <li>• Contingency: USD 0.7 mln.</li> <li>• Total Cost : USD 4.8 mln.</li> </ul>																
Implementation Schedule																
<table border="1"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td>NO.2</td> <td>0.8</td> <td>2.0</td> <td>2.0</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Project	2009	2010	2011	2012	2013	2014	2015	NO.2	0.8	2.0	2.0				
Project	2009	2010	2011	2012	2013	2014	2015									
NO.2	0.8	2.0	2.0													
Unit: mln USD																


## Project Profile

Project No. and Project Name: SN-3 Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement Plan for 2014																	
<p><b>Background of the Project</b></p> <p>Current severe problems are observed in congested low-standard housing areas in Bushrod Islands and Central Monrovia to Sinkor. Most of these areas have no access to the sewer network and their means of service is limited to pit latrines or no facilities. During the wet seasons, the latrines are mostly flooded and cannot be used.</p> <p>The majority of residents in high density areas does not have access to facilities at all and are forced to waste by open defecation in the field and riverbed surrounding their houses due to the lack of public toilets.</p> <p>Most of the low-density areas are served by septic tanks. This system is an adequate solution for the wastewater disposal in areas with low population density and was found to operate effectively.</p> <p>Therefore, mostly in the areas where it is difficult to have private toilet, more public toilets shall be installed and also community sanitation system shall be installed in the area where are provided with private toilet in community.</p> <p>Accordingly, provision of vacuum trucks to transfer night soil and sludge generated from public toilets and community sanitation system to the sludge treatment plant is urgently required.</p> <p>This Project is planned to provide necessary public toilets, community sanitation systems and vacuum trucks urgently for the target year of 2014 for Greater Monrovia including the areas surrounding Bushrod Islands and Central Monrovia to Sinkor area to cover approx. 50% of population with sanitation in Greater Monrovia.</p>	<p><b>Effects of the Project</b></p> <p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 270,000 inhabitants in Greater Monrovia</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of the quality of life</li> <li>Promotion of work activities</li> </ul> <p><b>Evaluation of the Project</b></p> <p><b>Economic Viability:</b></p> <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the sewerage system for citizens and environmental hygiene.</li> </ul> <p><b>Financial Soundness:</b></p> <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul> <p><b>Environmental Impact: Category C</b></p> <ul style="list-style-type: none"> <li>Positive Impacts Improve hygiene service and living standard</li> <li>Negative Impacts Specific negative impact is not found</li> </ul> <p><b>External Conditions</b></p> <ul style="list-style-type: none"> <li>Responsible organizations such as LWSC and Committees of served communities have sufficient capabilities for operating and maintaining sanitary systems.</li> </ul> <p><b>Preconditions</b></p> <p>O&amp;M cost of the sanitary systems shall be covered by beneficiaries.</p>																
<p><b>Objectives of the Project</b></p> <ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<p><b>Relationship with other projects</b></p> <ul style="list-style-type: none"> <li>There are five (5) projects for sewerage and sanitary system for Greater Monrovia. This project is one of them for the year of 2014.</li> </ul>																
<p><b>Location of the Project</b></p> <ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>	<p><b>Remarks</b></p> <p>General Layout of Proposed System in Greater Monrovia</p>																
<p><b>Scope of the Project</b></p> <p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Construction of 66 Community Sanitary Systems (One Community size: approx. 3,000 houses)</li> <li>Construction of 225 public toilets (One toilets size: 8 seats)</li> <li>Provision of 8 vacuum trucks ( Capacity of one vehicle: approx. 7m<sup>3</sup>)</li> </ul>																	
<p><b>Agencies Responsible</b></p> <ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: Communities to be served</li> <li>Maintenance: LWSC and Communities to be served</li> </ul>																	
<p><b>Estimated Cost</b></p> <ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 18.1 mln.</li> <li>Contingency: USD 3.3 mln.</li> <li>Total Cost : USD 21.4 mln.</li> </ul>																	
<p><b>Implementation Schedule</b></p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Project</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td>NO.3</td> <td>---</td> <td>---</td> <td>5.35</td> <td>5.35</td> <td>5.35</td> <td>5.35</td> <td>---</td> </tr> </tbody> </table> <p>Unit: mln USD</p>	Project	2009	2010	2011	2012	2013	2014	2015	NO.3	---	---	5.35	5.35	5.35	5.35	---	
Project	2009	2010	2011	2012	2013	2014	2015										
NO.3	---	---	5.35	5.35	5.35	5.35	---										


## Project Profile

Project No. and Project Name: SN-4 Project for Reconstruction of Sewerage Treatment & Sludge Treatment Plant															
Background of the Project	Effects of the Project														
<p>The existing sewerage treatment plant with sludge lagoon constructed in 1979 is located in the wetland in the southern part of Greater Monrovia. Not only wastewater of households which is connected to sewer system, but also night soil drawn by vacuum trucks from other households that cannot use sewer system has been discharged into the sewerage treatment plant. However, the operation of sewerage treatment plant has been suspended for a long period and the wastewater and night soil have flown into the stabilization pond without any treatment.</p> <p>Therefore, rehabilitation of the existing sewerage facilities including pipelines, pump stations and sewerage treatment plant for Central Monrovia areas is urgently required.</p> <p>The rehabilitation of sewerage pipelines and pump stations in Bushrod islands and Central Monrovia to Sinkor area to recover the condition of pre-war are planned by WB as shown in Project File No.2 mentioned above.</p> <p>On the other hand, sludge and night soil generated from the Community Sanitary Systems and the public toilets in Greater Monrovia which are planned as mentioned in Project File No.3 and No.5 shall be urgently treated.</p> <p>Accordingly, construction of the sewerage and sludge treatment plants is urgently required.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 910,000 inhabitants in Greater Monrovia</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of the quality of life</li> <li>Promotion of work activities</li> </ul>														
	Evaluation of the Project														
	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>NPV : USD 17.1 mln</li> <li>B/C : 0.72</li> <li>EIRR : 6.4%</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul> <p>Environmental Impact: <b>Category A</b></p> <ul style="list-style-type: none"> <li>Positive Impacts <ul style="list-style-type: none"> <li>Improve the hygiene service and living standard</li> </ul> </li> <li>Negative Impacts <ul style="list-style-type: none"> <li>Possible resettlement of commune locating within Fiamo treatment plant</li> <li>Possible negative impact to Mesurado Wetland</li> </ul> </li> </ul>														
	External Conditions														
	<ul style="list-style-type: none"> <li>Responsible organization LWSC has sufficient capabilities for operating and maintaining treatment plants.</li> </ul>														
Objectives of the Project															
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>															
Location of the Project															
<ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>															
Scope of the Project	Preconditions														
<p>The project includes the following items :</p> <ol style="list-style-type: none"> <li>Reconstruction of the sewerage treatment plant <ul style="list-style-type: none"> <li>Capacity of 6 MG/day (22,700m<sup>3</sup>/day) lagoon type treatment system to recover the condition of pre-war level taking into consideration that the existing sound underground pipelines will be left as it is without increasing pipe size after rehabilitation, de-sludge and cleaning.</li> </ul> </li> <li>Construction of sludge treatment plant <ul style="list-style-type: none"> <li>Capacity of 230m<sup>3</sup>/day sludge treatment plant shall be planned to treat sludge generated from Community Sanitary Systems and Public Toilets.</li> </ul> </li> </ol> <p>Both sewerage and sludge treatment plants will be constructed in the area for Fiamo sewerage treatment plant.</p>	<ul style="list-style-type: none"> <li>O&amp;M cost of the treatment plants shall be covered by beneficiaries.</li> <li>Land use in Fiamo sewerage treatment plant is required.</li> </ul>														
	Relationship with other projects														
	<ul style="list-style-type: none"> <li>There are five (5) projects for sewerage and sanitary system for Greater Monrovia. This project is one of them for the year of 2019.</li> </ul>														
	Remarks														
Agencies Responsible															
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: LWSC</li> <li>Maintenance: LWSC</li> </ul>															
Estimated Cost															
<ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 63 mln.</li> <li>Contingency: USD 11.3 mln.</li> <li>Total Cost : USD 74.2 mln.</li> </ul>															
Implementation Schedule															
<table border="1"> <thead> <tr> <th>Project</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>NO.4</td> <td></td> <td>14.84</td> <td>14.84</td> <td>14.84</td> <td>14.84</td> <td>14.84</td> </tr> </tbody> </table>	Project	2014	2015	2016	2017	2018	2019	NO.4		14.84	14.84	14.84	14.84	14.84	
Project	2014	2015	2016	2017	2018	2019									
NO.4		14.84	14.84	14.84	14.84	14.84									
Unit: mln USD															

## Project Profile


Project No. and Project Name: SN-5 Community Sanitary System and Public Toilet Installation & Vacuum Truck Procurement Plan for 2019															
Background of the Project	Effects of the Project														
<p>This Project has a close relation to No.3 Project mentioned above.</p> <p>This Project is planned to provide the necessary public toilets, community sanitation systems and vacuum trucks for the target year of 2019 for Greater Monrovia including the areas surrounding Central Monrovia and Bushrod islands to cover approx. 80% of population with sanitation in Greater Monrovia.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 590,000 inhabitants in Greater Monrovia</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of water-borne disease</li> <li>Improvement of the quality of life</li> <li>Promotion of work activities</li> </ul>														
	<p>Evaluation of the Project</p> <p>Economic Viability:</p> <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the sewerage system for citizens and environmental hygiene.</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul>														
Objectives of the Project	Environmental Impact: <b>Category C</b>														
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<ul style="list-style-type: none"> <li>Positive Impacts</li> <li>Improve the hygiene service and living standard</li> <li>Negative Impacts</li> <li>Specific negative impact is not found</li> </ul>														
	External Conditions														
Location of the Project	<ul style="list-style-type: none"> <li>Responsible organizations such as LWSC and Committees of served communities have sufficient capabilities for operating and maintaining sanitary systems.</li> </ul>														
<ul style="list-style-type: none"> <li>Greater Monrovia</li> </ul>															
Scope of the Project	Preconditions														
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Construction of 93 Community Sanitary Systems (One Community size: approx. 3,000 houses)</li> <li>Construction of 86 public toilets (One toilets size: 8 seats)</li> <li>Provision of 7 vacuum trucks ( Capacity of one vehicle: approx. 7m<sup>3</sup>)</li> </ul>	<p>O&amp;M cost of the sanitary systems shall be covered by beneficiaries.</p>														
	Agencies Responsible	Relationship with other projects													
<ul style="list-style-type: none"> <li>Project Implementation: Liberia Water and Sanitation Corporation (LWSC)</li> <li>Operation: Communities to be served</li> <li>Maintenance: LWSC and Communities to be served</li> </ul>	<ul style="list-style-type: none"> <li>There are five (5) projects for sewerage and sanitary system for Greater Monrovia. This project is one of them for the year of 2019.</li> </ul>														
Estimated Cost	Remarks														
<ul style="list-style-type: none"> <li>Implementation/Construction Cost (including design, construction supervision cost) : USD 22.5 mln.</li> <li>Contingency: USD 4.1 mln.</li> <li>Total Cost : USD 26.6 mln.</li> </ul>	<p>General Layout of Proposed System in Greater Monrovia</p> 														
Implementation Schedule															
<table border="1"> <thead> <tr> <th>Project</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>NO.5</td> <td></td> <td>5.32</td> <td>5.32</td> <td>5.32</td> <td>5.32</td> <td>5.32</td> </tr> </tbody> </table>	Project	2014	2015	2016	2017	2018	2019	NO.5		5.32	5.32	5.32	5.32	5.32	
Project	2014	2015	2016	2017	2018	2019									
NO.5		5.32	5.32	5.32	5.32	5.32									
Unit: mln USD															

## Project Profile


Project No. and Project Name: SW-1 Improvement of Drainage System in Monrovia Core Area																						
Background of the Project	Effects of the Project																					
The storm water drainage system in Monrovia was constructed in the period 1955 to 1957. The immigrants moved into the empty spaces in town, building their houses without considering the natural drainage pattern. Along the Mesurado River and its southern branches, the houses have been built up even in the very low-lying areas which have always been subjected to inundation. During the civil conflict, the drainage structures almost has damaged and lost its drainage function. The Emergency Rehabilitation Programme is implemented by World Bank, and some rehabilitation of drainage structures is still ongoing. For the acceleration of restoration, additional improvement of drainage system in Monrovia Core Area (Bushrod Island, Central Monrovia, Sinkor, Lakpazee and Old Road zones) is required for the development economic activity of Capital Monrovia.	a) Target Beneficiaries : <ul style="list-style-type: none"> <li>About 430,000 inhabitants in Monrovia Core Area</li> </ul> b) Effects of the Project : <ul style="list-style-type: none"> <li>Development of capital function of Greater Monrovia</li> <li>Improvement of the quality of life</li> <li>Promotion of work activities</li> </ul> Evaluation of the Project																					
Objectives of the Project	Economic Viability:																					
<ul style="list-style-type: none"> <li>To accelerate economic activity in Monrovia Core Area</li> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> </ul>	<ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the drainage system for citizens and environmental hygiene.</li> </ul> Financial Soundness: <ul style="list-style-type: none"> <li>Necessary the budget allocation</li> </ul> Environmental Impact: <b>Category C</b> <ul style="list-style-type: none"> <li>Positive Impacts                              Improve the hygiene service and living standard</li> <li>Negative Impacts                              Specific negative impact is not found</li> </ul>																					
Location of the Project	External Conditions																					
<ul style="list-style-type: none"> <li>Monrovia Core Area                              (Bushrod Island, Central Monrovia, Sinkor, Lakpazee, Old Road)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul> Preconditions <ul style="list-style-type: none"> <li>Operation Bureau, MPW is only drainage structures management authority in Monrovia.</li> </ul> Relationship with other projects <ul style="list-style-type: none"> <li>Urban Infrastructure Construction and Rehabilitation of Monrovia Sewerage Network Pumping Stations, including drainage improvement is ongoing. The proposed project is supplementary to solve the inundation.</li> </ul>																					
Scope of the Project	Remarks																					
The project includes the following items : <ul style="list-style-type: none"> <li>Cleaning and replace/repair of drainage pipes</li> <li>Furnishing of locally made inlet grating</li> <li>Cleaning and repair of manholes</li> <li>Replacement of concrete manhole cover</li> <li>Concrete lining of existing open channels</li> <li>Construction of concrete channels</li> </ul>	 <p>--- : Project Area</p>																					
Agencies Responsible																						
<ul style="list-style-type: none"> <li>Project Implementation: Ministry of Public Works (MPW)</li> <li>Operation: MPW</li> <li>Maintenance: MPW</li> </ul>																						
Estimated Cost																						
<ul style="list-style-type: none"> <li>Construction Cost USD 8.7 mln.</li> <li>Others (Administration, ES, Contingency etc) USD 3.6 mln.</li> <li>Total Cost USD 12.3 mln.</li> </ul>																						
Implementation Schedule																						
<table border="1"> <thead> <tr> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019											
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019												




## Project Profile

Project No. and Project Name: SW-2 Equipment Supply of Drainage Pipes Cleaning																							
Background of the Project	Effects of the Project																						
In Monrovia Core Area, there are approximately 27 km underground pipes. After the civil conflict, the maintenance work of the pipes has not been sustained. In result, there are many blockages and damages in the underground pipes and manholes. During the rainy season, the drainage water flowing on the road surface by the blockage of the drain structures causes degradation of living environment for the inhabitants and breaching of the city road pavement. In addition, the commercial activity of the Core Area has been disturbed due to lack of drainage around the commercial buildings. For the keeping original function of the piped drainage, the equipment supply of drainage pipes cleaning is primary required. The capacity building of operation and maintenance activity is strengthened to the staff of MPW through the Project.	a) Target Beneficiaries : <ul style="list-style-type: none"> <li>About 160,000 inhabitants in Monrovia Core Area</li> </ul> b) Effects of the Project : <ul style="list-style-type: none"> <li>Reduction of inundation</li> <li>Improvement of the quality of life</li> <li>Promotion of commercial activity</li> </ul>																						
Objectives of the Project	Evaluation of the Project																						
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> <li>To strengthen the capacity building of operation and maintenance.</li> </ul>	Economic Viability: <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the drainage system for citizens and environmental hygiene.</li> </ul> Financial Soundness: <ul style="list-style-type: none"> <li>Necessary the budget allocation</li> </ul> Environmental Impact: <b>Category C</b> <ul style="list-style-type: none"> <li>Positive Impacts                             <ul style="list-style-type: none"> <li>Improve the hygiene service and living standard</li> </ul> </li> <li>Negative Impacts                             <ul style="list-style-type: none"> <li>Specific negative impact is not found</li> </ul> </li> </ul>																						
Location of the Project	External Conditions																						
<ul style="list-style-type: none"> <li>Monrovia Core Area (Bushrod Island, Central Monrovia, Sinkor, Lakpazee, Old Road) Zone</li> </ul>	<ul style="list-style-type: none"> <li>Responsible organizations such as LWSC and water committees of served communities have sufficient capabilities for operating and maintaining water supply system.</li> </ul>																						
Scope of the Project	Preconditions																						
The project includes the following items : <ul style="list-style-type: none"> <li>Procurement of equipment for drainage cleaning and others                             <ul style="list-style-type: none"> <li>4 tons water jet cleaner :219L/min x 19.6 Mpa (1 unit)</li> <li>4 tons vacuum cleaner (lift type) :21 m<sup>3</sup>/min x 97 Kpa (1 unit)</li> <li>4 tons water tank :4.5 m<sup>3</sup>, Hauling Dump Truck, 4 tons Truck, and others (generator, pump)</li> </ul> </li> <li>Preparation of drainage pipes cleanings plan</li> <li>Training of equipment operation</li> </ul>	<ul style="list-style-type: none"> <li>Equipment operator shall be prepared by MPW.</li> <li>The space of garage and parking with roof shall be prepared by MPW.</li> <li>Fuel cost shall be fully supplied by MPW.</li> </ul>																						
Agencies Responsible	Relationship with other projects																						
<ul style="list-style-type: none"> <li>Project Implementation: Ministry of Public Works (MPW)</li> <li>Operation: MPW</li> <li>Maintenance: MPW</li> </ul>	<ul style="list-style-type: none"> <li>Urban Infrastructure Construction and Rehabilitation of Monrovia Sewerage Network Pumping Stations under WB, including drainage improvement is ongoing. The proposed project is out of the scope of WB project.</li> </ul>																						
Estimated Cost	Implementation Schedule																						
<ul style="list-style-type: none"> <li>Procurement of Equipment USD 0.9 mln.</li> <li>Others (Administration, ES, Contingency etc) USD 0.4 mln.</li> <li>Total USD 1.3 mln.</li> </ul>	Remarks																						
<table border="1"> <thead> <tr> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019												 <p>Project area</p>
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019													

## Project Profile

Project No. and Project Name: SW-3 Establishment of Operation and Maintenance Management System																																																																																																				
Background of the Project	Effects of the Project																																																																																																			
<p>Primary function of the drainage is to flow the storm water in the rainy season. However, some blocking and drained water stagnation in the channel by the sludge and debris often can be seen in Soniwein River and it makes poor hygiene for living environment of the inhabitants. The cleanings of the channel or demolish of the solid waste shall be required before the rainy season starting.</p> <p>Generally, operation and maintenance work on a routine basis shall be done to achieve the objectives of drainage system through fulfilling of functions of drainage facilities such as drainage channel, underground drainage pipes, manholes and culverts.</p> <p>To perform the operation and maintenance work, the technical cooperation programme to strengthen the capacity of the organization of Operation Bureau, MPW shall be required.</p>	<p>a) Target Beneficiaries :</p> <ul style="list-style-type: none"> <li>About 430,000 inhabitants in Monrovia Core Area</li> </ul> <p>b) Effects of the Project :</p> <ul style="list-style-type: none"> <li>Reduction of inundation</li> <li>Improvement of the quality of life</li> <li>Promotion of work activities</li> </ul>																																																																																																			
Objectives of the Project	Evaluation of the Project																																																																																																			
<ul style="list-style-type: none"> <li>To raise the living standard of the residents.</li> <li>To improve environmental hygiene of residents.</li> <li>To reduce the inundation</li> </ul>	<p>Economic Viability:</p> <ul style="list-style-type: none"> <li>Although no economic analysis is done, it is expected to improve the drainage system for citizens and environmental hygiene.</li> </ul> <p>Financial Soundness:</p> <ul style="list-style-type: none"> <li>Necessary the budget allocation</li> </ul> <p>Environmental Impact: <b>Category C</b></p> <ul style="list-style-type: none"> <li>Positive Impacts Improve the hygiene service and living standard</li> <li>Negative Impacts Specific negative impact is not found</li> </ul>																																																																																																			
Location of the Project	External Conditions																																																																																																			
<ul style="list-style-type: none"> <li>Monrovia Core Area (Bushrod Island, Central Monrovia, Sinkor, Lakpazee, Old Road)</li> </ul>																																																																																																				
Scope of the Project	Preconditions																																																																																																			
<p>The project includes the following items :</p> <ul style="list-style-type: none"> <li>Preparation of operation and maintenance manual and guidance</li> <li>Preparation of drainage structures inventory</li> <li>Preparation of recording on maintenance work</li> <li>Plan preparation of public relations activities</li> </ul>	<ul style="list-style-type: none"> <li>Operation Bureau, MPW has the fully responsibility of operation and maintenance activity for the drainage structures in Monrovia.</li> </ul>																																																																																																			
Agencies Responsible	Relationship with other projects																																																																																																			
<ul style="list-style-type: none"> <li>Project Implementation: Ministry of Public Works (MPW)</li> <li>Operation: MPW</li> <li>Maintenance: MPW</li> </ul>	<ul style="list-style-type: none"> <li>Urban Infrastructure Construction and Rehabilitation of Monrovia Sewerage Network Pumping Stations under WB, including drainage improvement is ongoing. The proposed project is out of the scope of WB project.</li> </ul>																																																																																																			
Estimated Cost	Remarks																																																																																																			
<ul style="list-style-type: none"> <li>Personal Cost USD 0.2 mln.</li> <li>Others (Per diem, etc) USD 0.08 mln.</li> <li>Total USD 0.28 mln.</li> </ul>	 <p>Project area</p>																																																																																																			
Implementation Schedule																																																																																																				
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2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019																																																																																										

## Project Profile

Project No. and Project Name: CM-1 Community Infrastructure Improvement Project																																		
<b>Background of the Project</b> Restoration/improvement and improvement needs of the infrastructure of water supply, sanitation and road falls into the category of basic social service improvement of communities. Multi-components (road, water supply and sanitation) are integrated into one packaged program as Community Infrastructure Reconstruction Project so that timely implementation and effective procedure of the implementation can be achieved. On the other hand, community-based project implementation is expected to contribute to enhance skills of residents, community empowerment, and job creation. The project can also be divided into small projects according to area to make NGOs and donor country participate in its implementation.	<b>Effects of the Project</b> Target Beneficiaries : <ul style="list-style-type: none"> <li>The residents living in the communities where the Project is implemented. (approximately 240,00 residents)</li> </ul> Effects: <ul style="list-style-type: none"> <li>Vehicle operation cost savings &amp; travel time reduction</li> <li>Reduction of damages on the vehicle</li> <li>Improvement of accessibility</li> <li>Increase of maintainable road sections</li> <li>Improvement of sanitary condition</li> <li>Improvement of safe water access</li> <li>Job creation</li> <li>Skill up of community workers</li> <li>Community empowerment</li> </ul>																																	
<b>Objectives of the Project</b> <ul style="list-style-type: none"> <li>To enhance community living standard</li> <li>Community empowerment</li> <li>To create jobs</li> <li>To rehabilitate damaged community roads in Greater Monrovia</li> <li>To secure the access from/to village</li> <li>To secure safe water supply</li> <li>To secure sanitation</li> </ul>	<b>Evaluation of the Project</b> Economic Viability <ul style="list-style-type: none"> <li>Total benefits including vehicle-km and vehicle-hour are calculated in the “without” and “with” case.                              NPV : USD 123 mln                              B/C : 0.76 - 4.08                              EIRR: 7.5 - 42.4 %</li> </ul> Financial Soundness <ul style="list-style-type: none"> <li>Necessary budget allocation</li> </ul> Environmental Impact: <b>Category B</b> <ul style="list-style-type: none"> <li>Positive Impacts                              Improve sanitation condition of the community                              Improvement of accessibility to social/public facilities for residents</li> <li>Negative Impacts                              Land acquisition to build new road or to widen roads, to construct deep well and toilet</li> </ul>																																	
<b>Location of the Project</b> <ul style="list-style-type: none"> <li>Communities in the urbanizing area with gross population density of 40 - 80 pop./ha.</li> </ul>	<b>External Conditions</b> <ul style="list-style-type: none"> <li>A good peace and order situation is maintained.</li> <li>Responsible community for operation and maintenance has sufficient capacity</li> </ul>																																	
<b>Scope of the Project</b> Construction of: <ul style="list-style-type: none"> <li>100 road sections</li> <li>20 deep wells and public kiosk</li> <li>138 Public toilet</li> </ul> Technical cooperation shall be included.	<b>Preconditions</b> <ul style="list-style-type: none"> <li>Necessary fund is prepared.</li> </ul>																																	
<b>Agencies Responsible</b> <ul style="list-style-type: none"> <li>Project Implementation : Ministry of Public Works, LWSC and Community</li> <li>Operation : Community</li> <li>Maintenance : Community</li> </ul>	<b>Relationship with other projects</b> <ul style="list-style-type: none"> <li>“TR-4 Road Network Rehabilitation”, “WS-5 Project for Expansion of Water Supply System at Paynesville in Greater Monrovia”, “SN-3 Community Sanitary System and Public Toilet Installation &amp; Vacuum Truck Procurement Plan for 2014”, and “SN-5 Community Sanitary System and Public Toilet Installation &amp; Vacuum Truck Procurement Plan for 2019”</li> </ul>																																	
<b>Estimated Cost</b> <ul style="list-style-type: none"> <li>Construction:                             <table style="margin-left: 20px;"> <tr> <td>Road:</td> <td>USD 16.09 mln.</td> </tr> <tr> <td>Water supply:</td> <td>USD 4.69 mln.</td> </tr> <tr> <td>Sanitation:</td> <td>USD 7.01 mln.</td> </tr> </table> </li> <li>Total Cost: USD 27.79 mln.</li> </ul>	Road:	USD 16.09 mln.	Water supply:	USD 4.69 mln.	Sanitation:	USD 7.01 mln.	<b>Target Communities for the Project</b> 																											
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<b>Implementation Schedule</b> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Technical Cooperation</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Construction</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Technical Cooperation											Construction											
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