

## **ECONOMIC ANALYSIS–SUPPLEMENTARY TABLES**

1. **Economic Internal Rate of Return and Sensitivity Analysis.** The summary results and detailed computations are shown in Tables 1 to 5.
2. **Distribution of Net Economic Benefits and Poverty Impact Ratio.** The summary results and detailed computations are shown in Tables 6 to 9.

**Table 1 : Kampot Wastewater**

EIRR - WASTEWATER																														
BASE CASE				NPV	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Capital Investment	KR billion			-	(22.10)	(14.74)	-																							
Operation + Maintenance	KR billion		1.75				(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	
Benefits	KR billion	31.25		-	-	-	1.30	1.34	2.43	3.62	3.74	3.87	5.53	5.72	5.93	7.64	7.91	8.18	10.49	10.85	11.23	15.28	15.81	15.81	15.81	15.81	15.81	15.81		
Consumer Surplus	KR billion	13.90		-	-	-	0.97	1.01	1.04	1.55	1.60	1.66	2.37	2.45	2.54	3.27	3.39	3.51	4.49	4.65	4.81	6.55	6.78	6.78	6.78	6.78	6.78	6.78		
Net Flow		9.02		-	(22.10)	(14.74)	0.80	0.88	2.00	3.69	3.87	4.06	6.43	6.70	6.99	9.44	9.82	10.22	13.51	14.03	14.58	20.35	21.12	21.12	21.12	21.12	21.12	21.12		
<b>EIRR</b>	<b>14.5%</b>																													
SENSITIVITY ANALYSIS				EIRR	NPV	SV																								
Increase in Capital Investment	<b>13.6%</b>	6.21	32%	-	(24.31)	(16.21)	0.80	0.88	2.00	3.69	3.87	4.06	6.43	6.70	6.99	9.44	9.82	10.22	13.51	14.03	14.58	20.35	21.12	21.12	21.12	21.12	21.12	21.12		
Increase in O+M	<b>14.3%</b>	8.22	113%	-	(22.10)	(14.74)	0.65	0.73	1.85	3.55	3.73	3.91	6.28	6.56	6.84	9.29	9.67	10.07	13.36	13.89	14.43	20.21	20.97	20.97	20.97	20.97	20.97	20.97		
Decrease in Benefits	<b>13.3%</b>	4.51	-20%	-	(22.10)	(14.74)	0.57	0.64	1.65	3.18	3.34	3.51	5.64	5.89	6.14	8.35	8.69	9.05	12.01	12.48	12.97	18.17	18.86	18.86	18.86	18.86	18.86	18.86		
1-Year Delay in Benefits	<b>12.8%</b>	3.00		-	(22.10)	(14.74)	(1.47)	0.80	0.88	2.00	3.69	3.87	4.06	6.43	6.70	6.99	9.44	9.82	10.22	13.51	14.03	14.58	20.35	21.12	21.12	21.12	21.12	21.12		

**Table 2: Kampot Solid Waste**

EIRR																													
BASE CASE: SOLID WASTE				NPV	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Capital Investment	KR billion			-	(4.33)	(4.33)	(2.16)																						
Operation + Maintenance	KR billion		1.1				(0.35)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	
Benefits	KR billion	16.58		-	-	-	1.04	1.06	1.20	1.69	1.87	2.06	2.68	2.93	3.17	3.97	4.24	4.55	5.56	5.91	6.29	7.57	8.06	8.06	8.06	8.06	8.06	8.06	
Consumer Surplus	KR billion	0.12		-	-	-	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
Net Flow		6.49		-	(4.33)	(4.33)	(1.46)	0.64	0.78	1.28	1.46	1.65	2.27	2.52	2.76	3.56	3.84	4.15	5.16	5.51	5.90	7.18	7.67	7.67	7.67	7.67	7.67	7.67	
<b>EIRR</b>	<b>18.1%</b>																												
SENSITIVITY ANALYSIS: SOLID WASTE				NPV	SV																								
Increase in Capital Investment	<b>17.0%</b>	5.70	82%	-	(4.76)	(4.76)	(1.67)	0.64	0.78	1.28	1.46	1.65	2.27	2.52	2.76	3.56	3.84	4.15	5.16	5.51	5.90	7.18	7.67	7.67	7.67	7.67	7.67	7.67	
Increase in Operation + Maintener	<b>17.9%</b>	6.26	282%	-	(4.33)	(4.33)	(1.49)	0.60	0.74	1.24	1.41	1.60	2.23	2.47	2.72	3.52	3.79	4.11	5.11	5.47	5.86	7.14	7.63	7.63	7.63	7.63	7.63	7.63	
Decrease in Benefits	<b>16.7%</b>	4.82	-39%	-	(4.33)	(4.33)	(1.56)	0.53	0.66	1.11	1.27	1.44	2.00	2.22	2.44	3.16	3.41	3.69	4.60	4.92	5.27	6.42	6.86	6.86	6.86	6.86	6.86	6.86	
1-Year Delay in Benefits	<b>15.9%</b>	4.28		-	(4.33)	(4.33)	(2.51)	0.62	0.64	0.78	1.28	1.46	1.65	2.27	2.52	2.76	3.56	3.84	4.15	5.16	5.51	5.90	7.18	7.67	7.67	7.67	7.67	7.67	

**Table 3: Kampot Urban Drainage**

EIRR																													
BASE CASE: URBAN DRAINAGE				NPV	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Capital Investment	KR billion			-	(1.89)	(3.16)	(1.26)																						
Operation + Maintenance	KR billion			-	-	-	(0.20)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	
Benefits	KR billion	7.25		-	-	-	1.29	1.30	1.30	1.31	1.32	1.32	1.33	1.34	1.35	1.35	1.36	1.37	1.37	1.38	1.39	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
Net Flow		1.35		-	(1.89)	(3.16)	(0.17)	1.04	1.05	1.06	1.06	1.07	1.08	1.09	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	
<b>EIRR</b>	<b>16.2%</b>																												
SENSITIVITY ANALYSIS: URBAN DRAINAGE				NPV	SV																								
Increase in Capital Investment	<b>14.5%</b>	0.90	30%	-	(2.08)	(3.47)	(0.30)	1.04	1.05	1.06	1.06	1.07	1.08	1.09	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	
Increase in Operation + Maintener	<b>15.8%</b>	1.22	101%	-	(1.89)	(3.16)	(0.19)	1.02	1.03	1.03	1.04	1.05	1.05	1.06	1.07	1.07	1.08	1.09	1.10	1.10	1.11	1.12	1.12	1.12	1.12	1.12	1.12	1.12	
Decrease in Benefits	<b>14.0%</b>	0.63	-19%	-	(1.89)	(3.16)	(0.30)	0.91	0.92	0.93	0.93	0.94	0.95	0.95	0.96	0.96	0.97	0.98	0.98	0.99	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	
1-Year Delay in Benefits	<b>13.4%</b>	0.50		-	(1.89)	(3.16)	(1.46)	1.04	1.04	1.05	1.06	1.06	1.07	1.08	1.09	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	

**Table 4: Sihanoukville Solid Waste**

EIRR - SOLID WASTE																												
BASE CASE			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Capital Investment	KR billion		-	(4.48)	(4.48)	(2.24)	-																					
Operation + Maintenance	KR billion	1.4			(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	
Benefits	KR billion	11.69	-	-	-	0.65	0.73	0.80	1.19	1.29	1.39	1.90	2.03	2.16	2.82	2.99	3.16	4.02	4.24	4.47	5.59	5.87	5.87	5.87	5.87	5.87	5.87	
Consumer Surplus	KR billion	0.86	-	-	-	0.08	0.08	0.09	0.11	0.11	0.12	0.14	0.15	0.16	0.19	0.20	0.21	0.25	0.27	0.28	0.34	0.36	0.36	0.36	0.36	0.36	0.36	
Net Flow		1.92	-	(4.48)	(4.48)	(1.96)	0.36	0.44	0.85	0.96	1.06	1.60	1.73	1.87	2.57	2.74	2.92	3.83	4.06	4.30	5.48	5.78	5.78	5.78	5.78	5.78		
EIRR		13.9%																										
SENSITIVITY ANALYSIS: EIRR - SOLID WASTE			NPV	SV																								
Increase in Capital Investment	13.0%	1.10	23%	-	(4.93)	(4.93)	(2.18)	0.36	0.44	0.85	0.96	1.06	1.60	1.73	1.87	2.57	2.74	2.92	3.83	4.06	4.30	5.48	5.78	5.78	5.78	5.78	5.78	
Increase in Operation + Maintener	13.7%	1.68	79%	-	(4.48)	(4.48)	(2.00)	0.32	0.40	0.81	0.91	1.02	1.55	1.69	1.83	2.52	2.70	2.88	3.78	4.01	4.25	5.43	5.73	5.73	5.73	5.73	5.73	
Decrease in Benefits	12.7%	0.67	-15%	-	(4.48)	(4.48)	(2.03)	0.28	0.35	0.72	0.82	0.91	1.39	1.51	1.64	2.26	2.42	2.59	3.40	3.61	3.82	4.88	5.15	5.15	5.15	5.15	5.15	
1-Year Delay in Benefits	12.2%	0.25	-	(4.48)	(4.48)	(2.69)	0.28	0.36	0.44	0.85	0.96	1.06	1.60	1.73	1.87	2.57	2.74	2.92	3.83	4.06	4.30	5.48	5.78	5.78	5.78	5.78	5.78	

**Table 5: Sihanoukville Urban Drainage**

EIRR																												
BASE CASE: URBAN DRAINAGE			NPV																									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Capital Investment	KR billion		-	(11.21)	(18.68)	(7.47)																						
Operation + Maintenance	KR billion				(0.60)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	(0.75)	
Benefits	KR billion	35.78	-	-	-	5.60	5.74	5.89	6.03	6.18	6.34	6.50	6.66	6.83	7.00	7.17	7.35	7.53	7.72	7.91	8.11	8.32	8.32	8.32	8.32	8.32	8.32	
Net Flow		4.82	-	(11.21)	(18.68)	(2.47)	4.99	5.14	5.29	5.44	5.59	5.75	5.91	6.08	6.25	6.42	6.60	6.79	6.97	7.17	7.37	7.57	7.57	7.57	7.57	7.57	7.57	
EIRR		14.3%																										
SENSITIVITY ANALYSIS: URBAN DRAINAGE			NPV	SV																								
Increase in Capital Investment	13.0%	2.13	18%	-	(12.33)	(20.55)	(3.22)	4.99	5.14	5.29	5.44	5.59	5.75	5.91	6.08	6.25	6.42	6.60	6.79	6.97	7.17	7.37	7.57	7.57	7.57	7.57	7.57	
Increase in Operation + Maintener	14.1%	4.43	121%	-	(11.21)	(18.68)	(2.53)	4.92	5.06	5.21	5.36	5.52	5.67	5.84	6.00	6.17	6.35	6.53	6.71	6.90	7.09	7.29	7.49	7.49	7.49	7.49	7.49	
Decrease in Benefits	12.6%	1.25	-13%	-	(11.21)	(18.68)	(3.03)	4.42	4.55	4.68	4.82	4.96	5.10	5.25	5.40	5.55	5.71	5.87	6.03	6.20	6.38	6.55	6.74	6.74	6.74	6.74	6.74	
1-Year Delay in Benefits	12.2%	0.55	-	(11.21)	(18.68)	(8.07)	4.85	4.99	5.14	5.29	5.44	5.59	5.75	5.91	6.08	6.25	6.42	6.60	6.79	6.97	7.17	7.37	7.57	7.57	7.57	7.57	7.57	

**Table 6: Distribution of Net Economic Benefits - Kampot (KR billion)**

Particulars	Financial PV	Economic PV	Economic PV LESS Financial PV	Government / Economy	Labor	Public	Consumers	Total
<b>Kampot - All Subprojects</b>								
Revenue / Benefits	35.0	69.1	34.1			7.3	26.8	34.1
Costs								
Equipment and Materials	32.6	24.3	(8.2)	8.2				8.2
Labor	14.0	10.4	(3.5)		3.5			3.5
Other Cost	23.3	17.4	(5.9)	5.9				5.9
Net Benefits	(34.9)	16.9	51.7	(34.9)				(34.9)
Gains and Losses				(20.7)	3.5	7.3	26.8	16.9
<b>Wastewater Collection and Treatment</b>								
Revenue / Benefits	18.5	45.2	26.6			-	26.6	26.6
Costs								
Equipment and Materials	22.6	16.9	(5.7)	5.7				5.7
Labor	9.7	7.2	(2.4)		2.4			2.4
Other Cost	16.1	12.0	(4.1)	4.1				4.1
Net Benefits	(29.8)	9.0	38.8	(29.8)				(29.8)
Gains and Losses				(20.0)	2.4	-	26.6	9.0
<b>Solid Waste Management</b>								
Revenue / Benefits	16.5	16.7	0.2				0.2	0.2
Costs								
Equipment and Materials	6.3	4.7	(1.6)	1.6				1.6
Labor	2.7	2.0	(0.7)		0.7			0.7
Other Cost	4.6	3.4	(1.2)	1.2				1.2
Net Benefits	2.8	6.5	3.6	2.8				2.8
Gains and Losses				5.6	0.7		0.2	6.5
<b>Urban Drainage</b>								
Revenue / Benefits	-	7.3	7.3			7.3		7.3
Costs								
Equipment and Materials	3.7	2.7	(0.9)	0.9				0.9
Labor	1.6	1.2	(0.4)		0.4			0.4
Other Cost	2.7	2.0	(0.7)	0.7				0.7
Net Benefits	(7.9)	1.4	9.2	(7.9)				(7.9)
Gains and Losses				(6.3)	0.4	7.3		1.4

Note: PV=present value

**Table 7: Distribution of Net Economic Benefits – Sihanoukville (KR billion)**

Particulars	Financial PV	Economic PV	Economic PV LESS Financial PV	Government / Economy	Labor	Consumers /Public	Total
<b>Sihanoukville - All Subprojects</b>							
Revenue / Benefits	55.9	92.5	36.6			36.6	36.6
Costs							
Equipment and Materials	57.3	42.9	(14.5)	14.5			14.5
Labor	23.6	17.6	(6.0)		6.0		6.0
Other Cost	37.0	27.7	(9.4)	9.4			9.4
Net Benefits	(62.1)	4.3	66.5	(62.1)			(62.1)
Gains and Losses				(38.3)	6.0	36.6	4.3
<b>Solid Waste Management</b>							
Revenue / Benefits	11.7	12.5	0.9			0.9	0.9
Costs							
Equipment and Materials	6.6	4.9	(1.7)	1.7			1.7
Labor	2.8	2.1	(0.7)		0.7		0.7
Other Cost	4.8	3.6	(1.2)	1.2			1.2
Net Benefits	(2.5)	1.9	4.5	(2.5)			(2.5)
Gains and Losses				0.3	0.7	0.9	1.9
<b>Urban Drainage</b>							
Revenue / Benefits	-	35.8	35.8			35.8	35.8
Costs							
Equipment and Materials	21.7	16.2	(5.5)	5.5			5.5
Labor	8.3	6.2	(2.1)		2.1		2.1
Other Cost	11.5	8.6	(2.9)	2.9			2.9
Net Benefits	(41.4)	4.8	46.2	(41.4)			(41.4)
Gains and Losses				(33.0)	2.1	35.8	4.8

Note: PV=present value

**Table 8: Poverty Impact Ratio - Kampot**

Items	Government / Economy	Labor	Public	Consumers	Total
<b>Kampot - All Subprojects</b>					
Gains and losses		3.5	7.3	26.8	37.6
Financial return	(20.7)				(20.7)
Benefits (Losses)	(20.7)	3.5	7.3	26.8	16.9
Proportion of poor	0.35	0.50	0.30	0.40	
Benefits to poor	(7.3)	1.8	2.2	10.7	7.4
Poverty Impact Ratio					0.44
<b>Wastewater Collection and Treatment</b>					
Gains and losses		2.4		26.6	29.1
Financial return	(20.0)				(20.0)
Benefits (Losses)	(20.0)	2.4		26.6	9.0
Proportion of poor	0.35	0.50		0.30	
Benefits to poor	(7.0)	1.2		8.0	2.2
Poverty Impact Ratio					0.24
<b>Solid Waste Management</b>					
Gains and losses		0.7		0.2	0.9
Financial return	5.6				5.6
Benefits (Losses)	5.6	0.7		0.2	6.5
Proportion of poor	0.35	0.50		0.30	
Benefits to poor	2.0	0.3		0.1	2.4
Poverty Impact Ratio					0.36
<b>Urban Drainage</b>					
Gains and losses		0.4	7.3		7.7
Financial return	(6.3)				(6.3)
Benefits (Losses)	(6.3)	0.4	7.3		1.4
Proportion of poor	0.35	0.50	0.30		
Benefits to poor	(2.2)	0.2	2.2		0.2
Poverty Impact Ratio					0.13

**Table 9: Poverty Impact – Sihanoukville**

Items	Government / Economy	Labor	Consumers / Public	Total
<b>Sihanoukville - All Subprojects</b>				
Gains and losses		6.0	36.6	42.6
Financial return	(38.3)			(38.3)
Benefits (Losses)	(38.3)	6.0	36.6	4.3
Proportion of poor	0.35	0.50	0.35	
Benefits to poor	(13.4)	3.0	12.8	2.4
Poverty Impact Ratio				0.56
<b>Solid Waste Management</b>				
Gains and losses		0.72	0.86	1.58
Financial return	0.34			0.34
Benefits (Losses)	0.34	0.72	0.86	1.92
Proportion of poor	0.35	0.50	0.30	
Benefits to poor	0.12	0.36	0.26	0.74
Poverty Impact Ratio				0.38
<b>Urban Drainage</b>				
Gains and losses		2.1	35.8	37.9
Financial return	(33.0)			(33.0)
Benefits (Losses)	(33.0)	2.1	35.8	4.8
Proportion of poor	0.35	0.50	0.30	
Benefits to poor	(11.6)	1.0	10.7	0.2
Poverty Impact Ratio				0.04