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SHAPING A VIBRANT INDIA

Final Report

Financial and Economic Viability of Kalpasar Project

Volume II

Submitted by:

Grant Thornton Bharat LLP

&

G Tech Infrastructure Pvt. Ltd.

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Table of Contents

32

Financial and Economic Viability Analysis

Annexure A: Projections for Dyke and Allied Project

Table A.1 Project cash flow profile for (Base-case scenario)

Year	2027	2037	2047	2057	2067	2076
Cash Inflows						
Revenue from Fisheries	-	87.52	213.86	287.42	386.26	503.98
Revenue from Irrigation/fresh water	-	6,353.43	15,913.98	40,553.30	104,258.73	244,835.75
Revenues from Land	-	16,663.12	16,663.12	16,663.12	-	-
Total Revenue in Cr	**-**	**23,104.07**	**32,790.96**	**57,503.84**	**104,644.99**	**245,339.74**
Debt Inflow	2,010.17	-	-	-	-	-
Equity Inflow	861.50	-	-	-	-	-
Total Inflows	**2,871.67**	**23,104.07**	**32,790.96**	**57,503.84**	**104,644.99**	**245,339.74**
Cash outflows						
Capex	2,871.67	-	-	-	-	-
Opex	-	5,269.06	8,582.75	13,980.39	22,772.59	35,327.75
Principal Repayment	-	3,489.74	3,489.74	-	-	-
Interest	-	4,082.99	1,989.15	-	-	-
Total Outflows	**2,871.67**	**12,841.79**	**14,061.64**	**13,980.39**	**22,772.59**	**35,327.75**
Net cash flow before tax	**-**	***10,262.28***	***18,729.33***	***43,523.45***	***81,872.40***	***210,011.98***
Tax	-	-	4,812.87	10,683.00	20,512.49	52,823.29
Net cash flow after tax	**-**	**10,262.28**	**13,916.46**	**32,840.45**	**61,359.91**	**157,188.69**

Table A.2 Project Balance sheet for (Base-case scenario)

Year	2027	2037	2047	2057	2067	2076
Assets						
Gross Block	2,871.67	109,677.46	109,677.46	109,677.46	109,677.46	109,677.46
Accumulated Depreciation	-	29,722.59	81,798.92	99,956.81	106,288.08	108,364.34
Net Block	2,871.67	79,954.87	27,878.54	9,720.65	3,389.38	1,313.12
Cash	-	18,094.13	130,048.52	344,901.58	826,965.69	1,795,390.38
Total Assets	**2,871.67**	**98,049.00**	**157,927.06**	**354,622.23**	**830,355.07**	**1,796,703.49**
Liabilities						
Equity	861.50	32,903.24	32,903.24	32,903.24	32,903.24	32,903.24
Retained Earnings	-	(1,159.25)	93,616.19	321,718.99	797,451.84	1,763,800.26
Debt	2,010.17	66,305.01	31,407.64	-	-	-
Total Equity and Liabilities	**2,871.67**	**98,049.00**	**157,927.06**	**354,622.23**	**830,355.07**	**1,796,703.49**

Table A.3 Project Profit and Loss Statement for (Base-case scenario)

Year	2027	2037	2047	2057	2067	2076
Revenues						
Revenue from Fisheries	-	87.52	213.86	287.42	386.26	503.98
Revenue from Irrigation/fresh water	-	6,353.43	15,913.98	40,553.30	104,258.73	244,835.75
Revenues from Land	-	16,663.12	16,663.12	16,663.12	-	-
Total Revenue	**-**	**23,104.07**	**32,790.96**	**57,503.84**	**104,644.99**	**245,339.74**
Total Expenses						
Opex	-	5,269.06	8,582.75	13,980.39	22,772.59	35,327.75
Interest	-	4,082.99	1,989.15	-	-	-
Depreciation	-	8,883.87	3,097.62	1,080.07	376.60	145.90
Total Expenses	**-**	**18,235.93**	**13,669.51**	**15,060.46**	**23,149.18**	**35,473.66**
Profit Before Tax	**-**	**4,868.14**	**19,121.45**	**42,443.37**	**81,495.80**	**209,866.08**
Accumulated losses	-	(1,159.25)	-	-	-	-
Tax @ 25.17%	-	-	4,812.87	10,683.00	20,512.49	52,823.29
Net Profit after tax	**-**	**4,868.14**	**14,308.58**	**31,760.38**	**60,983.31**	**157,042.79**

Table A.4 Project cash flow profile for (Optimistic scenario)

Year	2027	2037	2047	2057	2067	2076
Cash Inflows						
Revenue from Fisheries	-	131.29	320.80	431.12	579.39	755.98
Revenue from Irrigation/fresh water	-	7,003.84	17,544.21	44,709.02	1,14,944.56	2,69,931.87
Revenues from Land	-	20,455.88	20,455.88	20,455.88	-	-
Total Revenue in Cr	-	27,591.00	38,320.88	65,596.02	1,15,523.96	2,70,687.84
Debt Inflow	1,893.48	-	-	-	-	-
Equity Inflow	811.49	-	-	-	-	-
Total Inflows	**2,704.97**	**27,591.00**	**38,320.88**	**65,596.02**	**1,15,523.96**	**2,70,687.84**
Cash outflows						
Capex	2,704.97	-	-	-	-	-
Opex	-	4,963.19	8,084.52	13,168.83	21,450.64	33,276.98
Principal Repayment	-	3,287.16	3,287.16	-	-	-
Interest	-	3,845.97	1,873.68	-	-	-
Total Outflows	**2,704.97**	**12,096.33**	**13,245.36**	**13,168.83**	**21,450.64**	**33,276.98**
Net cash flow before tax	**-**	**15,494.67**	**25,075.52**	**52,427.19**	**94,073.32**	**2,37,410.87**
Tax	-	2,621.12	6,404.48	12,939.85	23,588.97	59,721.72
Net cash flow after tax	**-**	**12,873.55**	**18,671.05**	**39,487.34**	**70,484.35**	**1,77,689.14**

Table A.5 Project cash flow profile for (Best-case scenario)

Year	2027	2037	2047	2057	2067	2076
Cash Inflows						
Revenue from Fisheries	-	131.29	320.80	431.12	579.39	755.98
Revenue from Irrigation/fresh water	-	7,003.84	17,544.21	44,709.02	1,14,944.56	2,69,931.87
Revenues from Land	-	20,455.88	20,455.88	20,455.88	-	-
Total Revenue in Cr	**-**	**27,591.00**	**38,320.88**	**65,596.02**	**1,15,523.96**	**2,70,687.84**
Debt Inflow	1,778.75	-	-	-	-	-
Equity Inflow	762.32	-	-	-	-	-
Total Inflows	**2,541.07**	**27,591.00**	**38,320.88**	**65,596.02**	**1,15,523.96**	**2,70,687.84**
Cash outflows						
Capex	2,541.07	-	-	-	-	-
Opex	-	4,662.46	7,594.66	12,370.91	20,150.90	31,260.66
Principal Repayment	-	3,087.98	3,087.98	-	-	-
Interest	-	3,612.94	1,760.15	-	-	-
Total Outflows	**2,541.07**	**11,363.39**	**12,442.80**	**12,370.91**	**20,150.90**	**31,260.66**
Net cash flow before tax	**-**	**16,227.61**	**25,878.08**	**53,225.11**	**95,373.06**	**2,39,427.18**
Tax	-	2,883.09	6,600.85	13,156.20	23,921.52	60,231.33
Net cash flow after tax	**-**	**13,344.52**	**19,277.24**	**40,068.91**	**71,451.53**	**1,79,195.86**

Table A.6 Project cash flow profile for (Worst-case scenario)

Year	2027	2037	2047	2057	2067	2076
Cash Inflows						
Revenue from Fisheries	-	52.51	128.32	172.45	231.76	302.39
Revenue from Irrigation/fresh water	-	5,703.02	14,283.75	36,397.58	93,572.89	2,19,739.64
Revenues from Land	-	13,509.02	13,509.02	13,509.02	-	-
Total Revenue in Cr	**-**	**19,264.55**	**27,921.09**	**50,079.06**	**93,804.64**	**2,20,042.03**
Debt Inflow	2,249.64	-	-	-	-	-
Equity Inflow	964.13	-	-	-	-	-
Total Inflows	**3,213.77**	**19,264.55**	**27,921.09**	**50,079.06**	**93,804.64**	**2,20,042.03**
Cash outflows						
Capex	3,213.77	-	-	-	-	-
Opex	-	5,896.76	9,605.20	15,645.86	25,485.45	39,536.30
Principal Repayment	-	3,905.46	3,905.46	-	-	-
Interest	-	4,569.39	2,226.11	-	-	-
Total Outflows	**3,213.77**	**14,371.62**	**15,736.78**	**15,645.86**	**25,485.45**	**39,536.30**
Net cash flow before tax	**-**	**4,892.94**	**12,184.32**	**34,433.20**	**68,319.20**	**1,80,505.73**
Tax	-	-	3,177.25	8,362.60	17,089.86	45,392.20
Net cash flow after tax	**-**	**4,892.94**	**9,007.07**	**26,070.60**	**51,229.34**	**1,35,113.54**

Table A.7 Project cash flow profile for (Pessimistic scenario)

Year	2027	2037	2047	2057	2067	2076
Cash Inflows						
Revenue from Fisheries	-	52.51	128.32	172.45	231.76	302.39
Revenue from Irrigation/fresh water	-	5,703.02	14,283.75	36,397.58	93,572.89	2,19,739.64
Revenues from Land	-	13,509.02	13,509.02	13,509.02	-	-
Total Revenue in Cr	**-**	**19,264.55**	**27,921.09**	**50,079.06**	**93,804.64**	**2,20,042.03**
Debt Inflow	2,128.87	-	-	-	-	-
Equity Inflow	912.37	-	-	-	-	-
Total Inflows	**3,041.24**	**19,264.55**	**27,921.09**	**50,079.06**	**93,804.64**	**2,20,042.03**
Cash outflows						
Capex	3,041.24	-	-	-	-	-
Opex	-	5,580.21	9,089.57	14,805.95	24,117.33	37,413.89
Principal Repayment	-	3,695.81	3,695.81	-	-	-
Interest	-	4,324.10	2,106.61	-	-	-
Total Outflows	**3,041.24**	**13,600.11**	**14,891.99**	**14,805.95**	**24,117.33**	**37,413.89**
Net cash flow before tax	**-**	**5,664.44**	**13,029.11**	**35,273.11**	**69,687.32**	**1,82,628.14**
Tax	-	-	3,383.95	8,590.33	17,439.91	45,928.61
Net cash flow after tax	**-**	**5,664.44**	**9,645.16**	**26,682.78**	**52,247.41**	**1,36,699.53**

Annexure B: Projections for Road Project

Table B.1. Project cash flow profile for 50 years (Base-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflows	135.78	845.62	-	-	-	-	-	-	-	-	-
Debt Inflows	316.82	1,973.10	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	3,347.53	5,136.13	7,527.47	10,659.64	14,814.05	19,941.03	25,328.79	31,796.73	35,096.95
Non-fare box revenues	-	-	463.38	824.20	1,400.33	2,298.85	3,703.63	5,779.47	8,510.22	12,384.97	15,386.17
Total cash inflow	**452.60**	**2,818.72**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Cash outflows											
Capex	452.60	2,818.72	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	165.55	191.91	222.48	257.91	298.99	346.62	401.82	465.82	524.29
Principal repayment	-	-	380.52	380.52	380.52	380.52	-	-	-	-	-
Interest	-	-	742.02	551.76	361.50	171.24	-	-	-	-	-
Total cash outflow	**452.60**	**2,818.72**	**1,288.09**	**1,124.20**	**964.50**	**809.67**	**298.99**	**346.62**	**401.82**	**465.82**	**524.29**
Net cash flow before tax	**-**	**-**	**2,522.82**	**4,836.13**	**7,963.30**	**12,148.81**	**18,218.69**	**25,373.88**	**33,437.19**	**43,715.87**	**49,958.84**
Tax	-	-	404.54	1,168.28	2,035.91	3,125.14	4,573.00	6,380.99	8,413.65	11,002.18	12,574.06
Net cash flow after tax	**-**	**-**	**2,118.27**	**3,667.85**	**5,927.38**	**9,023.68**	**13,645.69**	**18,992.88**	**25,023.54**	**32,713.69**	**37,384.78**

Table B.2. Balance sheet

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Assets											
Gross Block	452.60	6,864.15	11,959.34	11,959.34	11,959.34	11,959.34	11,959.34	11,959.34	11,959.34	11,959.34	11,959.34
Accumulated Depreciation	-	-	4,614.81	8,700.54	10,513.39	11,317.77	11,674.67	11,833.03	11,903.30	11,934.48	11,946.36
Net Block	452.60	6,864.15	7,344.53	3,258.81	1,445.95	641.58	284.67	126.31	56.04	24.87	12.98
Cash	-	-	5,715.28	20,136.13	44,352.87	82,164.79	1,39,100.85	2,22,170.84	3,33,545.94	4,79,694.04	6,20,519.56
Total Assets	**452.60**	**6,864.15**	**13,059.82**	**23,394.94**	**45,798.83**	**82,806.37**	**1,39,385.52**	**2,22,297.15**	**3,33,601.99**	**4,79,718.91**	**6,20,532.54**
Liabilities											
Equity	135.78	2059.24	3587.80	3587.80	3587.80	3587.80	3587.80	3587.80	3587.80	3587.80	3587.80
Retained Earnings	0.00	0.00	2242.05	14479.79	38786.30	77696.47	135797.71	218709.35	330014.19	476131.11	616944.73
Debt	316.82	4804.90	7229.97	5327.34	3424.72	1522.10	0.00	0.00	0.00	0.00	0.00
Total Equity and Liabilities	**452.60**	**6,864.15**	**13,059.82**	**23,394.94**	**45,798.83**	**82,806.37**	**1,39,385.52**	**2,22,297.15**	**3,33,601.99**	**4,79,718.91**	**6,20,532.54**

Table B.3. Profit and loss statement

Year		2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Income												
Toll Revenue		-	0.000	3347.534	5136.131	7527.470	10659.639	14814.048	19941.029	25328.792	31796.730	35096.952
Other Income		-	-	463.38	824.20	1,400.33	2,298.85	3,703.63	5,779.47	8,510.22	12,384.97	15,386.17
Total Income			**0.000**	**3810.911**	**5960.329**	**8927.801**	**12958.488**	**18517.679**	**25720.494**	**33839.010**	**44181.696**	**50483.126**
Expenses												
Operation and maintenance cost		-	-	165.55	191.91	222.48	257.91	298.99	346.62	401.82	465.82	524.29
Depreciation		-	-	1,296.09	575.08	255.17	113.22	50.24	22.29	9.89	4.39	2.29
Interest		-	-	742.02	551.76	361.50	171.24	-	-	-	-	-
Total Expenses		**-**	**-**	**2,203.66**	**1,318.76**	**839.15**	**542.37**	**349.23**	**368.91**	**411.71**	**470.21**	**526.58**
Earnings before interest and tax (EBIT)		**-**	**-**	**2,349.27**	**5,193.33**	**8,450.15**	**12,587.35**	**18,168.45**	**25,351.59**	**33,427.30**	**43,711.49**	**49,956.55**
Earning before tax (EBT)		**-**	**-**	**1,607.25**	**4,641.57**	**8,088.66**	**12,416.12**	**18,168.45**	**25,351.59**	**33,427.30**	**43,711.49**	**49,956.55**
Accumulated Losses		-	-	-	-	-	-	-	-	-	-	-
Tax	25.17%	-	-	404.54	1,168.28	2,035.91	3,125.14	4,573.00	6,380.99	8,413.65	11,002.18	12,574.06
Earnings after Interest and Tax		**-**	**-**	**1,202.70**	**3,473.29**	**6,052.74**	**9,290.98**	**13,595.45**	**18,970.59**	**25,013.65**	**32,709.30**	**37,382.49**

Table B.4. Project cash flow profile for 50 years (Optimistic scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflows	127.45	793.73	-	-	-	-	-	-	-	-	-
Debt Inflows	297.38	1,852.04	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	3,347.53	5,136.13	7,527.47	10,659.64	14,814.05	19,941.03	25,328.79	31,796.73	35,096.95
Non-fare box revenues	-	-	463.38	824.20	1,400.33	2,298.85	3,703.63	5,779.47	8,510.22	12,384.97	15,386.17
Total cash inflow	**424.83**	**2,645.77**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Cash outflows											
Capex	424.83	2,645.77	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	155.39	180.14	208.83	242.09	280.65	325.35	377.17	437.24	492.12
Principal repayment	-	-	357.18	357.18	357.18	357.18	-	-	-	-	-
Interest	-	-	696.49	517.91	339.32	160.73	-	-	-	-	-
Total cash outflow	**424.83**	**2,645.77**	**1,209.06**	**1,055.22**	**905.32**	**760.00**	**280.65**	**325.35**	**377.17**	**437.24**	**492.12**
Net cash flow before tax	**-**	**-**	**2,601.85**	**4,905.11**	**8,022.48**	**12,198.49**	**18,237.03**	**25,395.15**	**33,461.84**	**43,744.46**	**49,991.01**
Tax	-	-	438.58	1,188.65	2,048.87	3,133.51	4,578.39	6,386.69	8,420.01	11,009.44	12,582.20
Net cash flow after tax	**-**	**-**	**2,163.28**	**3,716.46**	**5,973.60**	**9,064.98**	**13,658.64**	**19,008.45**	**25,041.83**	**32,735.01**	**37,408.81**

Table B.5. Project cash flow profile for 50 years (Best case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflows	119.32	743.07	-	-	-	-	-	-	-	-	-
Debt Inflows	278.40	1,733.84	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	3,347.53	5,136.13	7,527.47	10,659.64	14,814.05	19,941.03	25,328.79	31,796.73	35,096.95
Non-fare box revenues	-	-	463.38	824.20	1,400.33	2,298.85	3,703.63	5,779.47	8,510.22	12,384.97	15,386.17
Total cash inflow	**397.72**	**2,476.91**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Cash outflows											
Capex	397.72	2,476.91	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	145.47	168.64	195.50	226.64	262.74	304.58	353.09	409.33	460.71
Principal repayment	-	-	334.38	334.38	334.38	334.38	-	-	-	-	-
Interest	-	-	652.04	484.85	317.66	150.47	-	-	-	-	-
Total cash outflow	**397.72**	**2,476.91**	**1,131.89**	**987.87**	**847.54**	**711.49**	**262.74**	**304.58**	**353.09**	**409.33**	**460.71**
Net cash flow before tax	**-**	**-**	**2,679.02**	**4,972.46**	**8,080.26**	**12,247.00**	**18,254.94**	**25,415.91**	**33,485.92**	**43,772.36**	**50,022.42**
Tax	-	-	471.81	1,208.54	2,061.53	3,141.69	4,583.66	6,392.25	8,426.22	11,016.53	12,590.14
Net cash flow after tax	**-**	**-**	**2,207.21**	**3,763.92**	**6,018.73**	**9,105.31**	**13,671.29**	**19,023.66**	**25,059.70**	**32,755.83**	**37,432.28**

Table B.6. Project cash flow profile for 50 years (Pessimistic scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflows	144.32	898.77	-	-	-	-	-	-	-	-	-
Debt Inflows	336.74	2,097.13	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	3,347.53	5,136.13	7,527.47	10,659.64	14,814.05	19,941.03	25,328.79	31,796.73	35,096.95
Non-farebox revenues	-	-	463.38	824.20	1,400.33	2,298.85	3,703.63	5,779.47	8,510.22	12,384.97	15,386.17
Total cash inflow	**481.06**	**2,995.91**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Cash outflows											
Capex	481.06	2,995.91	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	175.95	203.98	236.46	274.13	317.79	368.40	427.08	495.10	557.24
Principal repayment	-	-	404.44	404.44	404.44	404.44	-	-	-	-	-
Interest	-	-	788.67	586.44	384.22	182.00	-	-	-	-	-
Total cash outflow	**481.06**	**2,995.91**	**1,369.06**	**1,194.87**	**1,025.13**	**860.57**	**317.79**	**368.40**	**427.08**	**495.10**	**557.24**
Net cash flow before tax	**-**	**-**	**2,441.85**	**4,765.46**	**7,902.67**	**12,097.92**	**18,199.89**	**25,352.09**	**33,411.93**	**43,686.59**	**49,925.88**
Tax	-	-	369.68	1,147.42	2,022.64	3,116.56	4,567.47	6,375.16	8,407.14	10,994.74	12,565.73
Net cash flow after tax	**-**	**-**	**2,072.17**	**3,618.05**	**5,880.03**	**8,981.36**	**13,632.42**	**18,976.93**	**25,004.79**	**32,691.85**	**37,360.15**

Table B.7. Project cash flow profile for 50 years (Worst scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflows	153.06	953.25	-	-	-	-	-	-	-	-	-
Debt Inflows	357.15	2,224.24	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	3,347.53	5,136.13	7,527.47	10,659.64	14,814.05	19,941.03	25,328.79	31,796.73	35,096.95
Non-fare box revenues	-	-	463.38	824.20	1,400.33	2,298.85	3,703.63	5,779.47	8,510.22	12,384.97	15,386.17
Total cash inflow	**510.21**	**3,177.49**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Cash outflows											
Capex	510.21	3,177.49	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	186.62	216.34	250.80	290.74	337.05	390.73	452.97	525.11	591.02
Principal repayment	-	-	428.96	428.96	428.96	428.96	-	-	-	-	-
Interest	-	-	836.47	621.99	407.51	193.03	-	-	-	-	-
Total cash outflow	**510.21**	**3,177.49**	**1,452.04**	**1,267.29**	**1,087.26**	**912.73**	**337.05**	**390.73**	**452.97**	**525.11**	**591.02**
Net cash flow before tax	**-**	**-**	**2,358.87**	**4,693.04**	**7,840.54**	**12,045.76**	**18,180.63**	**25,329.76**	**33,386.04**	**43,656.58**	**49,892.11**
Tax	-	-	333.95	1,126.04	2,009.03	3,107.76	4,561.81	6,369.18	8,400.46	10,987.12	12,557.19
Net cash flow after tax	**-**	**-**	**2,024.92**	**3,567.01**	**5,831.51**	**8,938.00**	**13,618.82**	**18,960.59**	**24,985.58**	**32,669.47**	**37,334.91**

Annexure C: Projections for Railway Project

Table C.1 Project cash flow profile for 50 years (Base-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflow	145.54	999.23	-	-	-	-	-	-	-	-	-
Debt Inflow	339.59	2,331.53	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	1,459.84	3,139.36	5,488.18	9,201.64	14,121.41	20,409.45	29,335.59	41,423.57	54,347.14
Freight revenue (with RORO)	-	-	99.49	272.33	540.41	835.31	1,210.44	1,683.88	2,212.36	2,791.03	3,311.13
Freight revenue (without RORO)	-	-	110.55	332.85	640.48	974.53	1,398.73	1,933.34	2,458.17	3,101.14	3,773.36
Non-Fare box revenue	-	-	364.96	784.84	1,372.05	2,300.41	3,530.35	5,102.36	7,333.90	10,355.89	13,586.79
Total Revenues	485.13	3,330.76	2,034.84	4,529.37	8,041.13	13,311.89	20,260.94	29,129.03	41,340.01	57,671.63	75,018.41
Cash outflows											
Capex	485.13	3,330.76	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	506.00	506.00	506.00	506.00	506.00	506.00	506.00	506.00	506.00
Share of Railways	-	-	83.49	187.23	333.45	550.57	836.53	1,201.33	1,700.31	2,365.79	3,071.58
Principal repayment	-	-	433.11	433.11	433.11	433.11	-	-	-	-	-
Interest	-	-	844.57	628.01	411.46	194.90	-	-	-	-	-
Total cash outflow	485.13	3,330.76	1,867.18	1,754.36	1,684.03	1,684.59	1,342.53	1,707.33	2,206.31	2,871.79	3,577.58
Net cash flow before tax	-	-	167.66	2,775.02	6,357.10	11,627.30	18,918.41	27,421.70	39,133.71	54,799.84	71,440.83
Tax	-	-	-	290.38	1,635.99	3,003.17	4,747.37	6,895.66	9,847.12	13,791.86	17,981.00
Net cash flow after tax	**-**	**-**	**167.66**	**2,484.64**	**4,721.10**	**8,624.13**	**14,171.04**	**20,526.04**	**29,286.59**	**41,007.98**	**53,459.83**

Table C.2 Balance sheet

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Assets											
Gross Block	485.13	7,824.94	13,612.15	13,612.15	13,612.15	13,612.15	13,612.15	13,612.15	13,612.15	13,612.15	13,612.15
Accumulated Depreciation	0	0	5252.587491	9902.96642	11966.36426	12881.90484	13288.13506	13468.38157	13548.3579	13583.84382	13597.3729
Net Block	485.13	7,824.94	8,359.56	3,709.18	1,645.78	730.24	324.01	143.77	63.79	28.30	14.77
Cash	-	-	(544.08)	7,301.35	18,758.72	53,261.93	95,051.86	184,110.33	305,089.18	485,693.24	679,333.97
Total Assets	**485.13**	**7,824.94**	**7,815.48**	**11,010.53**	**20,404.50**	**53,992.17**	**95,375.87**	**184,254.09**	**305,152.97**	**485,721.55**	**679,348.74**
Liabilities											
Equity	145.54	2347.48	4083.64	4083.64	4083.64	4083.64	4083.64	4083.64	4083.64	4083.64	4083.64
Retained Earnings	0.00	0.00	-4497.33	863.30	12422.83	48176.08	91292.22	180170.45	301069.33	481637.90	675265.10
Debt	339.59	5477.46	8229.16	6063.59	3898.02	1732.46	0.00	0.00	0.00	0.00	0.00
Total Equity and Liabilities	**485.13**	**7,824.94**	**7,815.48**	**11,010.53**	**20,404.50**	**53,992.17**	**95,375.87**	**184,254.09**	**305,152.97**	**485,721.55**	**679,348.74**

Table C.3 Profit and loss statement

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Revenue											
Fare Box Revenue from Passenger Traffic	0.00	0.00	1459.84	3139.36	5488.18	9201.64	14121.41	20409.45	29335.59	41423.57	54347.14
Freight revenue (with RORO)	0.00	0.00	99.49	272.33	540.41	835.31	1210.44	1683.88	2212.36	2791.03	3311.13
Freight revenue (without RORO)	0.00	0.00	110.55	332.85	640.48	974.53	1398.73	1933.34	2458.17	3101.14	3773.36
Non-Fare box revenue	0.00	0.00	364.96	784.84	1372.05	2300.41	3530.35	5102.36	7333.90	10355.89	13586.79
Total Revenues	**-**	**-**	**2,034.84**	**4,529.37**	**8,041.13**	**13,311.89**	**20,260.94**	**29,129.03**	**41,340.01**	**57,671.63**	**75,018.41**
Expenses											
Operation and maintenance cost	-	-	506.00	506.00	506.00	506.00	506.00	506.00	506.00	506.00	506.00
Share of Railways	-	-	83.49	187.23	333.45	550.57	836.53	1,201.33	1,700.31	2,365.79	3,071.58
Interest	-	-	844.57	628.01	411.46	194.90	-	-	-	-	-
Depreciation	-	-	1,475.22	654.56	290.43	128.87	57.18	25.37	11.26	4.99	2.61
Total Expenses	**0**	**-**	**2,909.28**	**1,975.80**	**1,541.34**	**1,380.34**	**1,399.71**	**1,732.70**	**2,217.56**	**2,876.78**	**3,580.19**
Profit Before Tax	**-**	**-**	**-874.44**	**2,553.57**	**6,499.78**	**11,931.55**	**18,861.23**	**27,396.33**	**39,122.45**	**54,794.85**	**71,438.23**
Accumulated losses	0	0	-4,497.33	-	-	-	-	-	-	-	-
Tax	-	-	-	290.38	1,635.99	3,003.17	4,747.37	6,895.66	9,847.12	13,791.86	17,981.00
Net Profit after tax	**0**	**0**	**-874.44**	**2,263.19**	**4,863.79**	**8,928.38**	**14,113.86**	**20,500.67**	**29,275.33**	**41,002.99**	**53,457.22**

Table C.4 Project cash flow profile for 50 years (Optimistic scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflow	136.64	938.13	-	-	-	-	-	-	-	-	-
Debt Inflow	318.83	2,188.96	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	1,532.83	3,296.33	5,762.59	9,661.72	14,827.48	21,429.92	30,802.37	43,494.75	57,064.50
Freight revenue (with RORO)	-	-	104.47	285.94	567.43	877.08	1,270.96	1,768.07	2,322.97	2,930.58	3,476.68
Freight revenue (without RORO)	-	-	116.07	349.49	672.51	1,023.25	1,468.67	2,030.01	2,581.08	3,256.20	3,962.03
Non-Fare box revenue	-	-	383.21	824.08	1,440.65	2,415.43	3,706.87	5,357.48	7,700.59	10,873.69	14,266.12
Total Revenues	455.47	3,127.09	2,136.58	4,755.84	8,443.18	13,977.48	21,273.99	30,585.48	43,407.01	60,555.21	78,769.33
Cash outflows											
Capex	455.47	3,127.09	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	480.70	480.70	480.70	480.70	480.70	480.70	480.70	480.70	480.70
Share of Railways	-	-	87.67	196.59	350.13	578.10	878.36	1,261.40	1,785.32	2,484.08	3,225.16
Principal repayment	-	-	406.63	406.63	406.63	406.63	-	-	-	-	-
Interest	-	-	792.93	589.61	386.30	182.98	-	-	-	-	-
Total cash outflow	455.47	3,127.09	1,767.93	1,673.53	1,623.75	1,648.42	1,359.06	1,742.10	2,266.02	2,964.78	3,705.86
Net cash flow before tax	-	-	368.66	3,082.31	6,819.43	12,329.07	19,914.93	28,843.38	41,140.99	57,590.44	75,063.47
Tax	-	-	-	723.49	1,750.17	3,175.12	4,999.08	7,253.88	10,352.53	14,494.33	18,892.86
Net cash flow after tax	**-**	**-**	**368.66**	**2,358.82**	**5,069.26**	**9,153.95**	**14,915.85**	**21,589.50**	**30,788.46**	**43,096.10**	**56,170.61**

Table C.5 Project cash flow profile for 50 years (Best case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflow	127.95	878.44	-	-	-	-	-	-	-	-	-
Debt Inflow	298.54	2,049.70	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	1,605.82	3,453.29	6,037.00	10,121.81	15,533.55	22,450.39	32,269.15	45,565.93	59,781.86
Freight revenue (with RORO)	-	-	109.44	299.56	594.45	918.84	1,331.49	1,852.27	2,433.59	3,070.13	3,642.24
Freight revenue (without RORO)	-	-	121.60	366.13	704.53	1,071.98	1,538.61	2,126.68	2,703.99	3,411.25	4,150.70
Non-Fare box revenue	-	-	401.46	863.32	1,509.25	2,530.45	3,883.39	5,612.60	8,067.29	11,391.48	14,945.46
Total Revenues	426.49	2,928.14	2,238.32	4,982.31	8,845.24	14,643.08	22,287.03	32,041.94	45,474.01	63,438.79	82,520.26
Cash outflows											
Capex	426.49	2,928.14	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	455.40	455.40	455.40	455.40	455.40	455.40	455.40	455.40	455.40
Share of Railways	-	-	91.84	205.95	366.80	605.63	920.18	1,321.47	1,870.34	2,602.37	3,378.74
Principal repayment	-	-	380.76	380.76	380.76	380.76	-	-	-	-	-
Interest	-	-	742.48	552.10	361.72	171.34	-	-	-	-	-
Total cash outflow	426.49	2,928.14	1,670.48	1,594.21	1,564.68	1,613.13	1,375.58	1,776.87	2,325.74	3,057.77	3,834.14
Net cash flow before tax	-	-	567.84	3,388.10	7,280.56	13,029.95	20,911.45	30,265.07	43,148.28	60,381.03	78,686.12
Tax	-	-	-	803.78	1,864.09	3,346.96	5,250.76	7,612.10	10,857.93	15,196.80	19,804.72
Net cash flow after tax	**-**	**-**	**567.84**	**2,584.32**	**5,416.47**	**9,682.99**	**15,660.69**	**22,652.96**	**32,290.35**	**45,184.23**	**58,881.40**

Table C.6 Project cash flow profile for 50 years (Pessimistic scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflow	154.65	1,061.80	-	-	-	-	-	-	-	-	-
Debt Inflow	360.86	2,477.53	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	1,386.85	2,982.39	5,213.78	8,741.56	13,415.34	19,388.97	27,868.81	39,352.39	51,629.78
Freight revenue (with RORO)	-	-	94.52	258.71	513.39	793.54	1,149.92	1,599.69	2,101.74	2,651.47	3,145.57
Freight revenue (without RORO)	-	-	105.02	316.20	608.46	925.80	1,328.80	1,836.68	2,335.26	2,946.08	3,584.69
Non-Fare box revenue	-	-	346.71	745.60	1,303.44	2,185.39	3,353.84	4,847.24	6,967.20	9,838.10	12,907.45
Total Revenues	515.51	3,539.33	1,933.10	4,302.90	7,639.07	12,646.30	19,247.89	27,672.58	39,273.01	54,788.05	71,267.49
Cash outflows											
Capex	515.51	3,539.33	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	531.30	531.30	531.30	531.30	531.30	531.30	531.30	531.30	531.30
Share of Railways	-	-	79.32	177.87	316.78	523.05	794.70	1,141.27	1,615.29	2,247.50	2,918.00
Principal repayment	-	-	460.23	460.23	460.23	460.23	-	-	-	-	-
Interest	-	-	897.46	667.34	437.22	207.11	-	-	-	-	-
Total cash outflow	515.51	3,539.33	1,968.31	1,836.74	1,745.54	1,721.69	1,326.00	1,672.57	2,146.59	2,778.80	3,449.30
Net cash flow before tax	-	-	-35.21	2,466.16	5,893.53	10,924.61	17,921.89	26,000.01	37,126.42	52,009.25	67,818.19
Tax	-	-	-	-0.00	1,521.56	2,831.10	4,495.65	6,537.42	9,341.71	13,089.39	17,069.14
Net cash flow after tax	**-**	**-**	**-35.21**	**2,466.16**	**4,371.97**	**8,093.51**	**13,426.24**	**19,462.60**	**27,784.71**	**38,919.86**	**50,749.05**

Table C.7 Project cash flow profile for 50 years (Worst scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows											
Equity Inflow	163.99	1,125.89	-	-	-	-	-	-	-	-	-
Debt Inflow	382.64	2,627.08	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	1,313.86	2,825.42	4,939.37	8,281.48	12,709.27	18,368.50	26,402.03	37,281.22	48,912.43
Freight revenue (with RORO)	-	-	89.54	245.10	486.37	751.78	1,089.40	1,515.49	1,991.12	2,511.92	2,980.01
Freight revenue (without RORO)	-	-	99.49	299.56	576.44	877.08	1,258.86	1,740.01	2,212.36	2,791.03	3,396.03
Non-Fare box revenue	-	-	328.46	706.36	1,234.84	2,070.37	3,177.32	4,592.13	6,600.51	9,320.30	12,228.11
Total Revenues	546.63	3,752.97	1,831.36	4,076.43	7,237.01	11,980.70	18,234.85	26,216.13	37,206.01	51,904.47	67,516.57
Cash outflows											
Capex	546.63	3,752.97	-	-	-	-	-	-	-	-	-
Operation and maintenance cost	-	-	556.60	556.60	556.60	556.60	556.60	556.60	556.60	556.60	556.60
Share of Railways	-	-	75.14	168.50	300.11	495.52	752.88	1,081.20	1,530.28	2,129.21	2,764.42
Principal repayment	-	-	488.02	488.02	488.02	488.02	-	-	-	-	-
Interest	-	-	951.63	707.62	463.61	219.61	-	-	-	-	-
Total cash outflow	546.63	3,752.97	2,071.39	1,920.74	1,808.34	1,759.74	1,309.48	1,637.80	2,086.88	2,685.81	3,321.02
Net cash flow before tax	-	-	-240.03	2,155.69	5,428.67	10,220.96	16,925.37	24,578.33	35,119.14	49,218.66	64,195.55
Tax	-	-	-	-0.00	1,406.86	2,658.90	4,243.90	6,179.17	8,836.29	12,386.92	16,157.28
Net cash flow after tax	**-**	**-**	**-240.03**	**2,155.69**	**4,021.81**	**7,562.06**	**12,681.47**	**18,399.16**	**26,282.84**	**36,831.74**	**48,038.27**

Annexure D: Projections for Renewable Energy Projects

Table D1: Wind Energy Project Cash flow profile for 30 years (Base-case scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	42.32	1,510.28	-	-	-	-
Debt Inflow	98.74	3,523.98	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	4,174.65	4,174.65	4,174.65	4,174.65
Total Cash Inflows	**141.06**	**5,034.26**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**
	-	-	-	-	-	-
Cash outflows	**-**	**-**	**-**	**-**	**-**	**-**
Capex	141.06	5,034.26	-	-	-	-
Operation and maintenance cost	-	-	413.34	518.20	649.66	784.35
Principal repayment	-	-	489.59	489.59	489.59	489.59
Interest	-	-	856.78	563.02	269.27	24.48
Total cash outflow	**141.06**	**5,034.26**	**1,759.71**	**1,570.81**	**1,408.52**	**1,298.42**
Net cash flow before tax	**-**	**-**	**2,414.94**	**2,603.83**	**2,766.12**	**2,876.23**
Tax	-	-	476.97	643.57	747.70	804.80
Net cash flow after tax	**-**	**-**	**1,937.97**	**1,960.26**	**2,018.43**	**2,071.43**

Table D2: Wind Energy Project Profit and loss statement for 30 years (Base-case scenario)

Year		**2027**	**2033**	**2039**	**2045**	**2051**	**2056**
Revenues							
Total Revenue		**-**	**-**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**
Total Expenses							
Opex		0.00	-	413.34	518.20	649.66	784.35
Interest		-	-	856.78	563.02	269.27	24.48
Depreciation		-	-	1,009.54	536.51	285.12	168.36
Total Expenses		-	-	2,279.66	1,617.74	1,204.06	977.19
Profit Before Tax		**-**	**-**	**1,894.98**	**2,556.91**	**2,970.59**	**3,197.45**
Accumulated losses		0	-	-	-	-	-
Tax	25.17%	-	-	476.97	643.57	747.70	804.80
Net Profit after tax		**0**	**-**	**1,418.02**	**1,913.33**	**2,222.89**	**2,392.65**

Table D3: Wind Energy Project Balance Sheet for 30 years (Base-case scenario)

Year			**2027**	**2033**	**2039**	**2045**	**2051**	**2056**
Assets								
Gross Block			141.06	12,841.63	15,387.00	15,387.00	15,387.00	15,387.00
Accumulated Depreciation			0	0	6301.130784	10558.39705	12820.88289	13871.73392
Net Block			141.06	12,841.63	9,085.87	4,828.60	2,566.12	1,515.27
Cash			-	-	9,749.22	21,427.33	33,383.96	43,636.54
Total Assets			**141.06**	**12,841.63**	**18,835.09**	**26,255.93**	**35,950.08**	**45,151.80**
Liabilities								
Equity			42.32	3852.49	4616.10	4616.10	4616.10	4616.10
Retained Earnings			0.00	0.00	5896.02	16254.38	28886.05	40535.70
Debt			98.74	8989.14	8322.97	5385.45	2447.93	0.00
Total Equity and Liabilities			**141.06**	**12,841.63**	**18,835.09**	**26,255.93**	**35,950.08**	**45,151.80**

Table D4: Wind Energy Project Cash flow profile for 30 years (Optimistic scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	39.86	1,422.66	-	-	-	-
Debt Inflow	93.02	3,319.54	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	4,383.38	4,383.38	4,383.38	4,383.38
Total Cash Inflows	**132.88**	**4,742.20**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**
	-	-	-	-	-	-
Cash outflows	**-**	**-**	**-**	**-**	**-**	**-**
Capex	132.88	4,742.20	-	-	-	-
Operation and maintenance cost	-	-	392.68	492.29	617.18	745.13
Principal repayment	-	-	461.18	461.18	461.18	461.18
Interest	-	-	807.07	530.36	253.65	23.06
Total cash outflow	**132.88**	**4,742.20**	**1,660.93**	**1,483.84**	**1,332.01**	**1,229.38**
Net cash flow before tax	**-**	**-**	**2,722.45**	**2,899.54**	**3,051.37**	**3,154.00**
Tax	-	-	561.96	718.69	816.51	870.02
Net cash flow after tax	**-**	**-**	**2,160.49**	**2,180.85**	**2,234.86**	**2,283.98**

Table D5: Wind Energy Project Cash flow profile for 30 years (Best-case scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	37.45	1,336.51	-	-	-	-
Debt Inflow	87.38	3,118.52	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	4,592.11	4,592.11	4,592.11	4,592.11
Total Cash Inflows	**124.83**	**4,455.02**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**
	-	-	-	-	-	-
Cash outflows	**-**	**-**	**-**	**-**	**-**	**-**
Capex	124.83	4,455.02	-	-	-	-
Operation and maintenance cost	-	-	372.01	466.38	584.70	705.92
Principal repayment	-	-	433.26	433.26	433.26	433.26
Interest	-	-	758.20	498.24	238.29	21.66
Total cash outflow	**124.83**	**4,455.02**	**1,563.46**	**1,397.88**	**1,256.24**	**1,160.83**
Net cash flow before tax	**-**	**-**	**3,028.65**	**3,194.23**	**3,335.87**	**3,431.28**
Tax	-	-	646.50	793.54	885.18	935.20
Net cash flow after tax	**-**	**-**	**2,382.15**	**2,400.69**	**2,450.69**	**2,496.07**

Table D6: Wind Energy Project Cash flow profile for 30 years (Pessimistic scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	44.82	1,599.40	-	-	-	-
Debt Inflow	104.57	3,731.94	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	3,965.91	3,965.91	3,965.91	3,965.91
Total Cash Inflows	**149.39**	**5,331.34**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**
	-	-	-	-	-	-
Cash outflows	**-**	**-**	**-**	**-**	**-**	**-**
Capex	149.39	5,331.34	-	-	-	-
Operation and maintenance cost	-	-	434.01	544.11	682.14	823.57
Principal repayment	-	-	518.48	518.48	518.48	518.48
Interest	-	-	907.34	596.25	285.16	25.92
Total cash outflow	**149.39**	**5,331.34**	**1,859.82**	**1,658.84**	**1,485.78**	**1,367.97**
Net cash flow before tax	**-**	**-**	**2,106.09**	**2,307.07**	**2,480.13**	**2,597.94**
Tax	-	-	391.51	568.18	678.75	739.53
Net cash flow after tax	**-**	**-**	**1,714.58**	**1,738.89**	**1,801.38**	**1,858.42**

Table D7: Wind Energy Project Cash flow profile for 30 years (Worst-case scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	47.36	1,690.07	-	-	-	-
Debt Inflow	110.50	3,943.49	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	3,757.18	3,757.18	3,757.18	3,757.18
Total Cash Inflows	**157.86**	**5,633.55**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**
	-	-	-	-	-	-
Cash outflows	**-**	**-**	**-**	**-**	**-**	**-**
Capex	157.86	5,633.55	-	-	-	-
Operation and maintenance cost	-	-	454.68	570.02	714.63	862.79
Principal repayment	-	-	547.87	547.87	547.87	547.87
Interest	-	-	958.77	630.05	301.33	27.39
Total cash outflow	**157.86**	**5,633.55**	**1,961.32**	**1,747.94**	**1,563.82**	**1,438.05**
Net cash flow before tax	**-**	**-**	**1,795.87**	**2,009.24**	**2,193.36**	**2,319.13**
Tax	-	-	305.57	492.51	609.66	674.20
Net cash flow after tax	**-**	**-**	**1,490.30**	**1,516.73**	**1,583.70**	**1,644.93**

Table D8: Solar Energy Project Cash flow profile for 30 years (Base-case scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	16.12	575.33	-	-	-	-
Debt Inflow	37.62	1,342.44	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	2,769.67	2,769.67	2,769.67	2,769.67
Total Cash Inflows	**53.74**	**1,917.77**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**
	-	-	-	-	-	-
Cash outflows	-	-	-	-	-	-
Capex	53.74	1,917.77	-	-	-	-
Operation and maintenance cost	-	-	157.46	197.41	247.49	298.80
Principal repayment	-	-	186.51	186.51	186.51	186.51
Interest	-	-	326.39	214.49	102.58	9.33
Total cash outflow	**53.74**	**1,917.77**	**670.36**	**598.40**	**536.58**	**494.64**
Net cash flow before tax	**-**	**-**	**2,099.31**	**2,171.27**	**2,233.09**	**2,275.04**
Tax	-	-	478.54	542.01	581.67	603.43
Net cash flow after tax	**-**	**-**	**1,620.77**	**1,629.26**	**1,651.42**	**1,671.61**

Table D9: Solar Energy Project Profit and Loss statement for 30 years (Base-case scenario)

Year			**2027**	**2033**	**2039**	**2045**	**2051**	**2056**
Revenues								
Total Revenue			**-**	**-**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**
Total Expenses								
Opex			0.00	-	157.46	197.41	247.49	298.80
Interest			-	-	326.39	214.49	102.58	9.33
Depreciation			-	-	384.59	204.39	108.62	64.14
Total Expenses			**-**	**-**	**868.44**	**616.28**	**458.69**	**372.26**
Profit Before Tax			**-**	**-**	**1,901.23**	**2,153.39**	**2,310.98**	**2,397.41**
Accumulated losses			0	-	-	-	-	-
Tax	25.17%		-	-	478.54	542.01	581.67	603.43
Net Profit after tax			**0**	**-**	**1,422.69**	**1,611.38**	**1,729.31**	**1,793.98**

Table D10: Solar Energy Project Balance Sheet for 30 years (Base-case scenario)

Year			**2027**	**2033**	**2039**	**2045**	**2051**	**2056**
Assets								
Gross Block			53.74	4,892.00	5,861.71	5,861.71	5,861.71	5,861.71
Accumulated Depreciation			0	0	2400.430775	4022.246496	4884.145864	5284.470066
Net Block			53.74	4,892.00	3,461.28	1,839.47	977.57	577.24
Cash			-	-	8,126.46	17,870.23	27,720.10	36,038.32
Total Assets			**53.74**	**4,892.00**	**11,587.74**	**19,709.70**	**28,697.67**	**36,615.56**
Liabilities								
Equity			16.12	1467.60	1758.51	1758.51	1758.51	1758.51
Retained Earnings			0.00	0.00	6658.57	15899.58	26006.61	34857.05
Debt			37.62	3424.40	3170.65	2051.60	932.55	0.00
Total Equity and Liabilities			**53.74**	**4,892.00**	**11,587.74**	**19,709.70**	**28,697.67**	**36,615.56**

Table D11: Solar Energy Project Cash flow profile for 30 years (Optimistic scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	15.19	541.95	-	-	-	-
Debt Inflow	35.43	1,264.56	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	2,908.16	2,908.16	2,908.16	2,908.16
Total Cash Inflows	**50.62**	**1,806.51**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**
	-	-	-	-	-	-
Cash outflows	-	-	-	-	-	-
Capex	50.62	1,806.51	-	-	-	-
Operation and maintenance cost	-	-	149.59	187.54	235.12	283.86
Principal repayment	-	-	175.69	175.69	175.69	175.69
Interest	-	-	307.46	202.04	96.63	8.78
Total cash outflow	**50.62**	**1,806.51**	**632.74**	**565.27**	**507.43**	**468.33**
Net cash flow before tax	**-**	**-**	**2,275.42**	**2,342.89**	**2,400.72**	**2,439.82**
Tax	-	-	525.76	585.47	622.73	643.12
Net cash flow after tax	**-**	**-**	**1,749.66**	**1,757.42**	**1,777.99**	**1,796.71**

Table D12: Solar Energy Project Cash flow profile for 30 years (Best-case scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	14.27	509.13	-	-	-	-
Debt Inflow	33.29	1,187.98	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	3,046.64	3,046.64	3,046.64	3,046.64
Total Cash Inflows	**47.56**	**1,697.11**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**
	-	-	-	-	-	-
Cash outflows	-	-	-	-	-	-
Capex	47.56	1,697.11	-	-	-	-
Operation and maintenance cost	-	-	141.72	177.67	222.74	268.92
Principal repayment	-	-	165.05	165.05	165.05	165.05
Interest	-	-	288.84	189.81	90.78	8.25
Total cash outflow	**47.56**	**1,697.11**	**595.60**	**532.53**	**478.57**	**442.22**
Net cash flow before tax	**-**	**-**	**2,451.04**	**2,514.11**	**2,568.07**	**2,604.42**
Tax	-	-	572.81	628.82	663.73	682.79
Net cash flow after tax	**-**	**-**	**1,878.23**	**1,885.29**	**1,904.34**	**1,921.63**

Table D13: Solar Energy Project Cash flow profile for 30 years (Pessimistic scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	17.07	609.28	-	-	-	-
Debt Inflow	39.84	1,421.65	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	2,631.19	2,631.19	2,631.19	2,631.19
Total Cash Inflows	**56.91**	**2,030.94**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**
	-	-	-	-	-	-
Cash outflows	-	-	-	-	-	-
Capex	56.91	2,030.94	-	-	-	-
Operation and maintenance cost	-	-	165.34	207.28	259.86	313.74
Principal repayment	-	-	197.52	197.52	197.52	197.52
Interest	-	-	345.65	227.14	108.63	9.88
Total cash outflow	**56.91**	**2,030.94**	**708.50**	**631.94**	**566.01**	**521.13**
Net cash flow before tax	**-**	**-**	**1,922.69**	**1,999.25**	**2,065.18**	**2,110.06**
Tax	-	-	431.14	498.45	540.57	563.72
Net cash flow after tax	**-**	**-**	**1,491.54**	**1,500.80**	**1,524.61**	**1,546.34**

Table D14: Solar Energy Project Cash flow profile for 30 years (Worst-case scenario)

Year	2027	2033	2039	2045	2051	2056
Cash Inflows						
Equity Inflow	18.04	643.82	-	-	-	-
Debt Inflow	42.09	1,502.24	-	-	-	-
Revenue in Cr (Tariff*Electricity generation)	-	-	2,492.71	2,492.71	2,492.71	2,492.71
Total Cash Inflows	**60.14**	**2,146.06**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**
	-	-	-	-	-	-
Cash outflows	-	-	-	-	-	-
Capex	60.14	2,146.06	-	-	-	-
Operation and maintenance cost	-	-	173.21	217.15	272.24	328.68
Principal repayment	-	-	208.71	208.71	208.71	208.71
Interest	-	-	365.25	240.02	114.79	10.44
Total cash outflow	**60.14**	**2,146.06**	**747.17**	**665.88**	**595.74**	**547.83**
Net cash flow before tax	**-**	**-**	**1,745.54**	**1,826.82**	**1,896.96**	**1,944.88**
Tax	-	-	383.56	454.78	499.40	523.99
Net cash flow after tax	**-**	**-**	**1,361.98**	**1,372.05**	**1,397.56**	**1,420.89**

Annexure E: Projections for Consolidated Project Bundle

Table E1: Project cash flow profile for 50 years (Base-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows from Operations and Financing											
Dyke Project											
Equity Inflows	*861.50*	*5,332.78*	-	-	-	-	-	-	-	-	-
Debt Inflows	*2,010.17*	*12,443.15*	-	-	-	-	-	-	-	-	-
Cash Inflow from Dyke	**2,871.67**	**17,775.93**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rail Project											
Equity Inflow	*145.54*	*999.23*	-	-	-	-	-	-	-	-	-
Debt Inflow	*339.59*	*2,331.53*	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	*1,459.84*	*3,139.36*	*5,488.18*	*9,201.64*	*14,121.41*	*20,409.45*	*29,335.59*	*41,423.57*	*54,347.14*
Freight revenue (with RORO)	-	-	*99.49*	*272.33*	*540.41*	*835.31*	*1,210.44*	*1,683.88*	*2,212.36*	*2,791.03*	*3,311.13*
Freight revenue (without RORO)	-	-	*110.55*	*332.85*	*640.48*	*974.53*	*1,398.73*	*1,933.34*	*2,458.17*	*3,101.14*	*3,773.36*
Non-Fare box revenue	-	-	*364.96*	*784.84*	*1,372.05*	*2,300.41*	*3,530.35*	*5,102.36*	*7,333.90*	*10,355.89*	*13,586.79*
Cash Inflows from Rail	**485.13**	**3,330.76**	**2,034.84**	**4,529.37**	**8,041.13**	**13,311.89**	**20,260.94**	**29,129.03**	**41,340.01**	**57,671.63**	**75,018.41**
Road Project											
Equity Inflows	*135.78*	*845.62*	-	-	-	-	-	-	-	-	-
Debt Inflows	*316.82*	*1,973.10*	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	*3,347.53*	*5,136.13*	*7,527.47*	*10,659.64*	*14,814.05*	*19,941.03*	*25,328.79*	*31,796.73*	*35,096.95*
Non Fare Box Revenue	-	-	*463.38*	*824.20*	*1,400.33*	*2,298.85*	*3,703.63*	*5,779.47*	*8,510.22*	*12,384.97*	*15,386.17*
Cash Inflows from Road	**452.60**	**2,818.72**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Solar Project											
Equity Inflow	*16.12*	*576.89*	-	-	-	-	-	-	-	-	-
Debt Inflow	*37.62*	*1,346.07*	-	-	-	-	-	-	-	-	-

Revenue	-	-	*2,769.67*	*2,769.67*	*2,769.67*	*2,769.67*	*2,769.67*	*2,769.67*	*2,769.67*	*2,769.67*	*2,769.67*
Cash Inflows from Solar	**53.74**	**1,922.95**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**	**2,769.67**
Wind Project											
Equity Inflow	*42.32*	*1,514.36*	-	-	-	-	-	-	-	-	-
Debt Inflow	*98.74*	*3,533.51*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*4,174.65*	*4,174.65*	*4,174.65*	*4,174.65*	*4,174.65*	*4,174.65*	*4,174.65*	*4,174.65*	*4,174.65*
Cash Inflows from Wind	**141.06**	**5,047.87**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**	**4,174.65**
Availability of Fresh Water											
Seasonal irrigation	-	-	*422.53*	*478.05*	*540.87*	*611.95*	*692.36*	*783.35*	*886.29*	*1,002.75*	*1,106.85*
Perennial irrigation	-	-	*7.69*	*8.71*	*9.85*	*11.14*	*12.61*	*14.27*	*16.14*	*18.26*	*20.16*
Drinking water	-	-	*1,047.87*	*1,687.61*	*2,717.91*	*4,377.22*	*7,049.56*	*11,353.38*	*18,284.74*	*29,447.76*	*43,114.46*
Industrial use	-	-	*4,875.33*	*7,851.76*	*12,645.35*	*20,365.46*	*32,798.77*	*52,822.75*	*85,071.56*	*137,008.60*	*200,594.29*
Cash Inflows from Fresh Water	**-**	**-**	**6,353.43**	**10,026.13**	**15,913.98**	**25,365.77**	**40,553.30**	**64,973.74**	**104,258.73**	**167,477.37**	**244,835.75**
Cash Inflow from Land Reclamation and Development											
Cash Inflows from Land	**-**	**-**	**16,663.12**	**16,663.12**	**16,663.12**	**16,663.12**	**16,663.12**	**16,663.12**	**-**	**-**	**-**
Cash Inflow from Fisheries Development											
Cash Inflows from Fisheries	**-**	**-**	**87.52**	**184.48**	**213.86**	**247.93**	**287.42**	**333.19**	**386.26**	**447.78**	**503.98**
Cash Inflow from Employment											
Cash Inflows from Employment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Cash Inflows from Operations and Financing	**4,004.21**	**30,896.24**	**35,894.14**	**44,307.75**	**56,704.21**	**75,491.52**	**103,226.78**	**143,763.90**	**186,768.33**	**276,722.79**	**377,785.60**
Cash outflows											
Capex											
Dyke Project	*2,871.67*	*17,775.93*	-	-	-	-	-	-	-	-	-
Railway	*485.13*	*3,330.76*	-	-	-	-	-	-	-	-	-
Road	*452.60*	*2,818.72*	-	-	-	-	-	-	-	-	-
Solar	*53.74*	*1,922.95*	-	-	-	-	-	-	-	-	-

Wind	*141.06*	*5,047.87*	-	-	-	-	-	-	-	-	-
Cash outflows from Capex	**4,004.21**	**30,896.24**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
O&M Expenses											
Dyke Project	-	-	5,269.06	6,724.81	8,582.75	10,954.00	13,980.39	17,842.92	22,772.59	29,064.23	35,327.75
Share of Railways	-	-	83.49	187.23	333.45	550.57	836.53	1,201.33	1,700.31	2,365.79	3,071.58
Railway	-	-	*506.00*	*506.00*	*506.00*	*506.00*	*506.00*	*506.00*	*506.00*	*506.00*	*506.00*
Road	-	-	*165.55*	*191.91*	*222.48*	*257.91*	*298.99*	*346.62*	*401.82*	*465.82*	*524.29*
Solar	-	-	*146.03*	*176.31*	*212.86*	*256.99*	*310.27*	*374.60*	*452.26*	*546.03*	*634.86*
Wind	-	-	*383.34*	*462.81*	*558.76*	*674.61*	*814.47*	*983.33*	*1,187.20*	*1,433.33*	*1,666.50*
Cash outflows from O&M Expenses	**-**	**-**	**6,553.47**	**8,249.07**	**10,416.31**	**13,200.09**	**16,746.66**	**21,254.80**	**27,020.17**	**34,381.20**	**41,730.97**
Financing Expenditure											
Dyke-Principal	-	-	*3,489.74*	*3,489.74*	*3,489.74*	*3,489.74*	-	-	-	-	-
Dyke-Interest	-	-	*4,082.99*	*3,036.07*	*1,989.15*	*942.23*	-	-	-	-	-
Railway-Principal	-	-	*433.11*	*433.11*	*433.11*	*433.11*	-	-	-	-	-
Railway-Interest	-	-	*844.57*	*628.01*	*411.46*	*194.90*	-	-	-	-	-
Road-Principal	-	-	*380.52*	*380.52*	*380.52*	*380.52*	-	-	-	-	-
Road-Interest	-	-	*742.02*	*551.76*	*361.50*	*171.24*	-	-	-	-	-
Solar-Principal	-	-	*186.51*	*186.51*	*186.51*	*186.51*	-	-	-	-	-
Solar-Interest	-	-	*363.69*	*270.44*	*177.18*	*83.93*	-	-	-	-	-
Wind-Principal	-	-	*489.59*	*489.59*	*489.59*	*489.59*	-	-	-	-	-
Wind-Interest	-	-	*954.69*	*709.90*	*465.11*	*220.31*	-	-	-	-	-
Cash outflows from P+I	**-**	**-**	**11,967.44**	**10,175.66**	**8,383.87**	**6,592.08**	**-**	**-**	**-**	**-**	**-**
Total cash outflow	**4,004.21**	**30,896.24**	**18,520.92**	**18,424.73**	**18,800.18**	**19,792.17**	**16,746.66**	**21,254.80**	**27,020.17**	**34,381.20**	**41,730.97**
Net cash flow before tax	**-**	**-**	**17,373.22**	**25,883.03**	**37,904.03**	**55,699.34**	**86,480.12**	**122,509.11**	**159,748.16**	**242,341.60**	**336,054.62**
Taxes											
Dyke	-	-	1,225.31	2,986.93	4,812.87	7,186.41	10,683.00	15,980.27	20,512.49	34,895.32	52,823.29

Railway	-	-	-	*290.38*	*1,635.99*	*3,003.17*	*4,747.37*	*6,895.66*	*9,847.12*	*13,791.86*	*17,981.00*
Road	-	-	*404.54*	*1,168.28*	*2,035.91*	*3,125.14*	*4,573.00*	*6,380.99*	*8,413.65*	*11,002.18*	*12,574.06*
Solar	-	-	*449.32*	*514.11*	*557.28*	*586.71*	*619.03*	*602.84*	*583.29*	*559.69*	*537.33*
Wind	-	-	*400.27*	*570.35*	*683.67*	*760.92*	*807.62*	*780.73*	*738.64*	*682.14*	*626.15*
Total Tax	**-**	**-**	**1,254.14**	**2,543.12**	**4,912.86**	**7,475.94**	**10,747.02**	**14,660.22**	**19,582.71**	**26,035.87**	**31,718.55**
Net cash flow after tax	**-**	**-**	**16,119.08**	**23,339.91**	**32,991.17**	**48,223.41**	**75,733.10**	**107,848.88**	**140,165.45**	**216,305.72**	**304,336.08**

Table E2: Project cash flow profile for 50 years (Optimistic-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows from Operations and Financing											
Dyke Project											
Equity Inflows	*811.49*	*5,023.21*	-	-	-	-	-	-	-	-	-
Debt Inflows	*1,893.48*	*11,720.82*	-	-	-	-	-	-	-	-	-
Cash Inflow from Dyke	**2,704.97**	**16,744.03**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rail Project											
Equity Inflow	*136.64*	*938.13*	-	-	-	-	-	-	-	-	-
Debt Inflow	*318.83*	*2,188.96*	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	*1,532.83*	*3,296.33*	*5,762.59*	*9,661.72*	*14,827.48*	*21,429.92*	*30,802.37*	*43,494.75*	*57,064.50*
Freight revenue (with RORO)	-	-	*104.47*	*285.94*	*567.43*	*877.08*	*1,270.96*	*1,768.07*	*2,322.97*	*2,930.58*	*3,476.68*
Freight revenue (without RORO)	-	-	*116.07*	*349.49*	*672.51*	*1,023.25*	*1,468.67*	*2,030.01*	*2,581.08*	*3,256.20*	*3,962.03*
Non-Fare box revenue	-	-	*383.21*	*824.08*	*1,440.65*	*2,415.43*	*3,706.87*	*5,357.48*	*7,700.59*	*10,873.69*	*14,266.12*
Cash Inflows from Rail	**455.47**	**3,127.09**	**2,136.58**	**4,755.84**	**8,443.18**	**13,977.48**	**21,273.99**	**30,585.48**	**43,407.01**	**60,555.21**	**78,769.33**
Road Project											
Equity Inflows	*127.45*	*793.73*	-	-	-	-	-	-	-	-	-
Debt Inflows	*297.38*	*1,852.04*	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	*3,347.53*	*5,136.13*	*7,527.47*	*10,659.64*	*14,814.05*	*19,941.03*	*25,328.79*	*31,796.73*	*35,096.95*
Non Fare Box Revenue	-	-	*463.38*	*824.20*	*1,400.33*	*2,298.85*	*3,703.63*	*5,779.47*	*8,510.22*	*12,384.97*	*15,386.17*
Cash Inflows from Road	**424.83**	**2,645.77**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Solar Project											
Equity Inflow	*15.19*	*543.42*	-	-	-	-	-	-	-	-	-

Debt Inflow	*35.43*	*1,267.97*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*2,908.16*	*2,908.16*	*2,908.16*	*2,908.16*	*2,908.16*	*2,908.16*	*2,908.16*	*2,908.16*	*2,908.16*
Cash Inflows from Solar	**50.62**	**1,811.39**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**	**2,908.16**
Wind Project											
Equity Inflow	*39.86*	*1,426.51*	-	-	-	-	-	-	-	-	-
Debt Inflow	*93.02*	*3,328.51*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*4,383.38*	*4,383.38*	*4,383.38*	*4,383.38*	*4,383.38*	*4,383.38*	*4,383.38*	*4,383.38*	*4,383.38*
Cash Inflows from Wind	**132.88**	**4,755.02**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**	**4,383.38**
Availability of Fresh Water											
Seasonal irrigation	-	-	*464.78*	*525.86*	*594.96*	*673.14*	*761.60*	*861.68*	*974.91*	*1,103.03*	*1,217.53*
Perennial irrigation	-	-	*8.66*	*9.79*	*11.08*	*12.54*	*14.19*	*16.05*	*18.16*	*20.54*	*22.68*
Drinking water	-	-	*1,113.36*	*1,793.08*	*2,887.78*	*4,650.80*	*7,490.16*	*12,062.97*	*19,427.54*	*31,288.24*	*45,809.11*
Industrial use	-	-	*5,417.03*	*8,724.18*	*14,050.38*	*22,628.28*	*36,443.08*	*58,691.94*	*94,523.96*	*152,231.78*	*222,882.54*
Cash Inflows from Fresh Water	**-**	**-**	**7,003.84**	**11,052.92**	**17,544.21**	**27,964.76**	**44,709.02**	**71,632.64**	**114,944.56**	**184,643.59**	**269,931.87**
Cash Inflow from Land Reclamation and Development											
Cash Inflows from Land	**-**	**-**	**20,455.88**	**20,455.88**	**20,455.88**	**20,455.88**	**20,455.88**	**20,455.88**	**-**	**-**	**-**
Cash Inflow from Fisheries Development											
Cash Inflows from Fisheries	**-**	**-**	**131.29**	**276.72**	**320.80**	**371.89**	**431.12**	**499.79**	**579.39**	**671.68**	**755.98**
Cash Inflow from Employment											
Cash Inflows from Employment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Cash Inflows from Operations and Financing	**3,768.77**	**29,083.31**	**40,830.03**	**49,793.22**	**62,983.40**	**83,020.04**	**112,679.22**	**156,185.82**	**200,061.52**	**297,343.70**	**407,231.84**
Cash outflows											
Capex											
Dyke Project	*2,704.97*	*16,744.03*	-	-	-	-	-	-	-	-	-
Railway	*455.47*	*3,127.09*	-	-	-	-	-	-	-	-	-
Road	*424.83*	*2,645.77*	-	-	-	-	-	-	-	-	-

Solar	*50.62*	*1,811.39*	-	-	-	-	-	-	-	-	-
Wind	*132.88*	*4,755.02*	-	-	-	-	-	-	-	-	-
Cash outflows from Capex	**3,768.77**	**29,083.31**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
O&M Expenses											
Dyke Project	-	-	4,963.19	6,334.43	8,084.52	10,318.12	13,168.83	16,807.13	21,450.64	27,377.05	33,276.98
Share of Railways	-	-	87.67	196.59	350.13	578.10	878.36	1,261.40	1,785.32	2,484.08	3,225.16
Railway	-	-	*480.70*	*480.70*	*480.70*	*480.70*	*480.70*	*480.70*	*480.70*	*480.70*	*480.70*
Road	-	-	*155.39*	*180.14*	*208.83*	*242.09*	*280.65*	*325.35*	*377.17*	*437.24*	*492.12*
Solar	-	-	*138.73*	*167.49*	*202.22*	*244.14*	*294.76*	*355.87*	*429.65*	*518.73*	*603.11*
Wind	-	-	*364.17*	*439.67*	*530.83*	*640.88*	*773.75*	*934.16*	*1,127.84*	*1,361.66*	*1,583.17*
Cash outflows from O&M Expenses	**-**	**-**	**6,189.85**	**7,799.02**	**9,857.22**	**12,504.04**	**15,877.04**	**20,164.62**	**25,651.31**	**32,659.46**	**39,661.24**
Financing Expenditure											
Dyke-Principal	-	-	*3,287.16*	*3,287.16*	*3,287.16*	*3,287.16*	-	-	-	-	-
Dyke-Interest	-	-	*3,845.97*	*2,859.83*	*1,873.68*	*887.53*	-	-	-	-	-
Railway-Principal	-	-	*406.63*	*406.63*	*406.63*	*406.63*	-	-	-	-	-
Railway-Interest	-	-	*792.93*	*589.61*	*386.30*	*182.98*	-	-	-	-	-
Road-Principal	-	-	*357.18*	*357.18*	*357.18*	*357.18*	-	-	-	-	-
Road-Interest	-	-	*696.49*	*517.91*	*339.32*	*160.73*	-	-	-	-	-
Solar-Principal	-	-	*175.69*	*175.69*	*175.69*	*175.69*	-	-	-	-	-
Solar-Interest	-	-	*342.59*	*254.75*	*166.90*	*79.06*	-	-	-	-	-
Wind-Principal	-	-	*461.18*	*461.18*	*461.18*	*461.18*	-	-	-	-	-
Wind-Interest	-	-	*899.31*	*668.72*	*438.12*	*207.53*	-	-	-	-	-
Cash outflows from P+I	**-**	**-**	**11,265.13**	**9,578.65**	**7,892.16**	**6,205.67**	**-**	**-**	**-**	**-**	**-**
Total cash outflow	**3,768.77**	**29,083.31**	**17,454.98**	**17,377.67**	**17,749.38**	**18,709.71**	**15,877.04**	**20,164.62**	**25,651.31**	**32,659.46**	**39,661.24**
Net cash flow before tax	**-**	**-**	**23,375.04**	**32,415.55**	**45,234.02**	**64,310.33**	**96,802.18**	**136,021.21**	**174,410.20**	**264,684.25**	**367,570.60**
Taxes											

Dyke	-	-	2,621.12	4,442.49	6,404.48	9,026.96	12,939.85	18,922.91	23,588.97	39,700.32	59,721.72
Railway	-	-	-	*723.49*	*1,750.17*	*3,175.12*	*4,999.08*	*7,253.88*	*10,352.53*	*14,494.33*	*18,892.86*
Road	-	-	*438.58*	*1,188.65*	*2,048.87*	*3,133.51*	*4,578.39*	*6,386.69*	*8,420.01*	*11,009.44*	*12,582.20*
Solar	-	-	*498.26*	*559.23*	*599.82*	*627.45*	*657.79*	*642.41*	*623.84*	*601.42*	*580.18*
Wind	-	-	*489.77*	*649.82*	*756.37*	*828.91*	*872.62*	*846.95*	*806.89*	*753.17*	*699.96*
Total Tax	**-**	**-**	**1,426.61**	**3,121.19**	**5,155.24**	**7,765.00**	**11,107.88**	**15,129.94**	**20,203.27**	**26,858.36**	**32,755.19**
Net cash flow after tax	**-**	**-**	**21,948.43**	**29,294.36**	**40,078.78**	**56,545.33**	**85,694.30**	**120,891.27**	**154,206.93**	**237,825.88**	**334,815.41**

Table E3: Project cash flow profile for 50 years (Best-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows from Operations and Financing											
Dyke Project											
Equity Inflows	*762.32*	*4,718.84*	-	-	-	-	-	-	-	-	-
Debt Inflows	*1,778.75*	*11,010.64*	-	-	-	-	-	-	-	-	-
Cash Inflow from Dyke	**2,541.07**	**15,729.48**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rail Project											
Equity Inflow	*127.95*	*878.44*	-	-	-	-	-	-	-	-	-
Debt Inflow	*298.54*	*2,049.70*	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	*1,605.82*	*3,453.29*	*6,037.00*	*10,121.81*	*15,533.55*	*22,450.39*	*32,269.15*	*45,565.93*	*59,781.86*
Freight revenue (with RORO)	-	-	*109.44*	*299.56*	*594.45*	*918.84*	*1,331.49*	*1,852.27*	*2,433.59*	*3,070.13*	*3,642.24*
Freight revenue (without RORO)	-	-	*121.60*	*366.13*	*704.53*	*1,071.98*	*1,538.61*	*2,126.68*	*2,703.99*	*3,411.25*	*4,150.70*
Non-Fare box revenue	-	-	*401.46*	*863.32*	*1,509.25*	*2,530.45*	*3,883.39*	*5,612.60*	*8,067.29*	*11,391.48*	*14,945.46*
Cash Inflows from Rail	**426.49**	**2,928.14**	**2,238.32**	**4,982.31**	**8,845.24**	**14,643.08**	**22,287.03**	**32,041.94**	**45,474.01**	**63,438.79**	**82,520.26**
Road Project											
Equity Inflows	*119.32*	*743.07*	-	-	-	-	-	-	-	-	-
Debt Inflows	*278.40*	*1,733.84*	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	*3,347.53*	*5,136.13*	*7,527.47*	*10,659.64*	*14,814.05*	*19,941.03*	*25,328.79*	*31,796.73*	*35,096.95*
Non Fare Box Revenue	-	-	*463.38*	*824.20*	*1,400.33*	*2,298.85*	*3,703.63*	*5,779.47*	*8,510.22*	*12,384.97*	*15,386.17*
Cash Inflows from Road	**397.72**	**2,476.91**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Solar Project											
Equity Inflow	*14.27*	*510.51*	-	-	-	-	-	-	-	-	-
Debt Inflow	*33.29*	*1,191.19*	-	-	-	-	-	-	-	-	-

Revenue	-	-	*3,046.64*	*3,046.64*	*3,046.64*	*3,046.64*	*3,046.64*	*3,046.64*	*3,046.64*	*3,046.64*	*3,046.64*
Cash Inflows from Solar	**47.56**	**1,701.70**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**	**3,046.64**
Wind Project											
Equity Inflow	*37.45*	*1,340.12*	-	-	-	-	-	-	-	-	-
Debt Inflow	*87.38*	*3,126.95*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*4,592.11*	*4,592.11*	*4,592.11*	*4,592.11*	*4,592.11*	*4,592.11*	*4,592.11*	*4,592.11*	*4,592.11*
Cash Inflows from Wind	**124.83**	**4,467.07**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**	**4,592.11**
Availability of Fresh Water											
Seasonal irrigation	-	-	*464.78*	*525.86*	*594.96*	*673.14*	*761.60*	*861.68*	*974.91*	*1,103.03*	*1,217.53*
Perennial irrigation	-	-	*8.66*	*9.79*	*11.08*	*12.54*	*14.19*	*16.05*	*18.16*	*20.54*	*22.68*
Drinking water	-	-	*1,113.36*	*1,793.08*	*2,887.78*	*4,650.80*	*7,490.16*	*12,062.97*	*19,427.54*	*31,288.24*	*45,809.11*
Industrial use	-	-	*5,417.03*	*8,724.18*	*14,050.38*	*22,628.28*	*36,443.08*	*58,691.94*	*94,523.96*	*152,231.78*	*222,882.54*
Cash Inflows from Fresh Water	**-**	**-**	**7,003.84**	**11,052.92**	**17,544.21**	**27,964.76**	**44,709.02**	**71,632.64**	**114,944.56**	**184,643.59**	**269,931.87**
Cash Inflow from Land Reclamation and Development											
Cash Inflows from Land	**-**	**-**	**20,455.88**	**20,455.88**	**20,455.88**	**20,455.88**	**20,455.88**	**20,455.88**	**-**	**-**	**-**
Cash Inflow from Fisheries Development											
Cash Inflows from Fisheries	**-**	**-**	**131.29**	**276.72**	**320.80**	**371.89**	**431.12**	**499.79**	**579.39**	**671.68**	**755.98**
Cash Inflow from Employment											
Cash Inflows from Employment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Cash Inflows from Operations and Financing	**3,537.67**	**27,303.30**	**41,278.98**	**50,366.91**	**63,732.67**	**84,032.85**	**114,039.48**	**157,989.49**	**202,475.73**	**300,574.50**	**411,329.97**
Cash outflows											
Capex											
Dyke Project	*2,541.07*	*15,729.48*	-	-	-	-	-	-	-	-	-
Railway	*426.49*	*2,928.14*	-	-	-	-	-	-	-	-	-
Road	*397.72*	*2,476.91*	-	-	-	-	-	-	-	-	-
Solar	*47.56*	*1,701.70*	-	-	-	-	-	-	-	-	-

Wind	*124.83*	*4,467.07*	-	-	-	-	-	-	-	-	-
Cash outflows from Capex	**3,537.67**	**27,303.30**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
O&M Expenses											
Dyke Project	-	-	4,662.46	5,950.62	7,594.66	9,692.93	12,370.91	15,788.76	20,150.90	25,718.22	31,260.66
Share of Railways	-	-	91.84	205.95	366.80	605.63	920.18	1,321.47	1,870.34	2,602.37	3,378.74
Railway	-	-	*455.40*	*455.40*	*455.40*	*455.40*	*455.40*	*455.40*	*455.40*	*455.40*	*455.40*
Road	-	-	*145.47*	*168.64*	*195.50*	*226.64*	*262.74*	*304.58*	*353.09*	*409.33*	*460.71*
Solar	-	-	*131.43*	*158.68*	*191.58*	*231.29*	*279.25*	*337.14*	*407.04*	*491.43*	*571.37*
Wind	-	-	*345.00*	*416.53*	*502.89*	*607.15*	*733.02*	*885.00*	*1,068.48*	*1,290.00*	*1,499.85*
Cash outflows from O&M Expenses	**-**	**-**	**5,831.61**	**7,355.82**	**9,306.83**	**11,819.04**	**15,021.49**	**19,092.35**	**24,305.25**	**30,966.74**	**37,626.73**
Financing Expenditure											
Dyke-Principal	-	-	*3,087.98*	*3,087.98*	*3,087.98*	*3,087.98*	-	-	-	-	-
Dyke-Interest	-	-	*3,612.94*	*2,686.54*	*1,760.15*	*833.76*	-	-	-	-	-
Railway-Principal	-	-	*380.76*	*380.76*	*380.76*	*380.76*	-	-	-	-	-
Railway-Interest	-	-	*742.48*	*552.10*	*361.72*	*171.34*	-	-	-	-	-
Road-Principal	-	-	*334.38*	*334.38*	*334.38*	*334.38*	-	-	-	-	-
Road-Interest	-	-	*652.04*	*484.85*	*317.66*	*150.47*	-	-	-	-	-
Solar-Principal	-	-	*165.05*	*165.05*	*165.05*	*165.05*	-	-	-	-	-
Solar-Interest	-	-	*321.85*	*239.32*	*156.80*	*74.27*	-	-	-	-	-
Wind-Principal	-	-	*433.26*	*433.26*	*433.26*	*433.26*	-	-	-	-	-
Wind-Interest	-	-	*844.85*	*628.22*	*411.59*	*194.96*	-	-	-	-	-
Cash outflows from P+I	**-**	**-**	**10,575.58**	**8,992.47**	**7,409.35**	**5,826.23**	**-**	**-**	**-**	**-**	**-**
Total cash outflow	**3,537.67**	**27,303.30**	**16,407.20**	**16,348.28**	**16,716.18**	**17,645.27**	**15,021.49**	**19,092.35**	**24,305.25**	**30,966.74**	**37,626.73**
Net cash flow before tax	**-**	**-**	**24,871.79**	**34,018.63**	**47,016.49**	**66,387.58**	**99,017.99**	**138,897.14**	**178,170.49**	**269,607.76**	**373,703.25**
Taxes											
Dyke	-	-	2,883.09	4,658.07	6,600.85	9,224.13	13,156.20	19,188.40	23,921.52	40,121.05	60,231.33

Railway	-	-	-	*803.78*	*1,864.09*	*3,346.96*	*5,250.76*	*7,612.10*	*10,857.93*	*15,196.80*	*19,804.72*
Road	-	-	*471.81*	*1,208.54*	*2,061.53*	*3,141.69*	*4,583.66*	*6,392.25*	*8,426.22*	*11,016.53*	*12,590.14*
Solar	-	-	*546.99*	*604.21*	*642.28*	*668.15*	*696.55*	*681.98*	*664.39*	*643.15*	*623.03*
Wind	-	-	*578.74*	*728.94*	*828.86*	*896.78*	*937.58*	*913.15*	*875.13*	*824.19*	*773.76*
Total Tax	**-**	**-**	**1,597.54**	**3,345.48**	**5,396.76**	**8,053.59**	**11,468.55**	**15,599.49**	**20,823.67**	**27,680.67**	**33,791.64**
Net cash flow after tax	**-**	**-**	**23,274.25**	**30,673.15**	**41,619.74**	**58,333.99**	**87,549.44**	**123,297.65**	**157,346.82**	**241,927.08**	**339,911.61**

Table E4: Project cash flow profile for 50 years (Pessimistic-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows from Operations and Financing											
Dyke Project											
Equity Inflows	*912.37*	*5,647.68*	-	-	-	-	-	-	-	-	-
Debt Inflows	*2,128.87*	*13,177.93*	-	-	-	-	-	-	-	-	-
Cash Inflow from Dyke	**3,041.24**	**18,825.61**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rail Project											
Equity Inflow	*154.65*	*1,061.80*	-	-	-	-	-	-	-	-	-
Debt Inflow	*360.86*	*2,477.53*	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	*1,386.85*	*2,982.39*	*5,213.78*	*8,741.56*	*13,415.34*	*19,388.97*	*27,868.81*	*39,352.39*	*51,629.78*
Freight revenue (with RORO)	-	-	*94.52*	*258.71*	*513.39*	*793.54*	*1,149.92*	*1,599.69*	*2,101.74*	*2,651.47*	*3,145.57*
Freight revenue (without RORO)	-	-	*105.02*	*316.20*	*608.46*	*925.80*	*1,328.80*	*1,836.68*	*2,335.26*	*2,946.08*	*3,584.69*
Non-Fare box revenue	-	-	*346.71*	*745.60*	*1,303.44*	*2,185.39*	*3,353.84*	*4,847.24*	*6,967.20*	*9,838.10*	*12,907.45*
Cash Inflows from Rail	**515.51**	**3,539.33**	**1,933.10**	**4,302.90**	**7,639.07**	**12,646.30**	**19,247.89**	**27,672.58**	**39,273.01**	**54,788.05**	**71,267.49**
Road Project											
Equity Inflows	*144.32*	*898.77*	-	-	-	-	-	-	-	-	-
Debt Inflows	*336.74*	*2,097.13*	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	*3,347.53*	*5,136.13*	*7,527.47*	*10,659.64*	*14,814.05*	*19,941.03*	*25,328.79*	*31,796.73*	*35,096.95*
Non Fare Box Revenue	-	-	*463.38*	*824.20*	*1,400.33*	*2,298.85*	*3,703.63*	*5,779.47*	*8,510.22*	*12,384.97*	*15,386.17*
Cash Inflows from Road	**481.06**	**2,995.91**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Solar Project											
Equity Inflow	*17.07*	*610.93*	-	-	-	-	-	-	-	-	-
Debt Inflow	*39.84*	*1,425.50*	-	-	-	-	-	-	-	-	-

Revenue	-	-	*2,631.19*	*2,631.19*	*2,631.19*	*2,631.19*	*2,631.19*	*2,631.19*	*2,631.19*	*2,631.19*	*2,631.19*
Cash Inflows from Solar	**56.91**	**2,036.43**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**	**2,631.19**
Wind Project											
Equity Inflow	*44.82*	*1,603.73*	-	-	-	-	-	-	-	-	-
Debt Inflow	*104.57*	*3,742.03*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*3,965.91*	*3,965.91*	*3,965.91*	*3,965.91*	*3,965.91*	*3,965.91*	*3,965.91*	*3,965.91*	*3,965.91*
Cash Inflows from Wind	**149.39**	**5,345.75**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**	**3,965.91**
Availability of Fresh Water											
Seasonal irrigation	-	-	*380.28*	*430.25*	*486.79*	*550.75*	*623.13*	*705.01*	*797.66*	*902.48*	*996.16*
Perennial irrigation	-	-	*6.73*	*7.62*	*8.62*	*9.75*	*11.03*	*12.48*	*14.12*	*15.98*	*17.64*
Drinking water	-	-	*982.38*	*1,582.13*	*2,548.04*	*4,103.64*	*6,608.96*	*10,643.80*	*17,141.94*	*27,607.27*	*40,419.81*
Industrial use	-	-	*4,333.62*	*6,979.35*	*11,240.31*	*18,102.63*	*29,154.46*	*46,953.55*	*75,619.16*	*121,785.42*	*178,306.03*
Cash Inflows from Fresh Water	**-**	**-**	**5,703.02**	**8,999.35**	**14,283.75**	**22,766.78**	**36,397.58**	**58,314.84**	**93,572.89**	**150,311.15**	**219,739.64**
Cash Inflow from Land Reclamation and Development											
Cash Inflows from Land	**-**	**-**	**13,509.02**	**13,509.02**	**13,509.02**	**13,509.02**	**13,509.02**	**13,509.02**	**-**	**-**	**-**
Cash Inflow from Fisheries Development											
Cash Inflows from Fisheries	**-**	**-**	**52.51**	**110.69**	**128.32**	**148.76**	**172.45**	**199.92**	**231.76**	**268.67**	**302.39**
Cash Inflow from Employment											
Cash Inflows from Employment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Cash Inflows from Operations and Financing	**4,244.11**	**32,743.03**	**31,605.66**	**39,479.39**	**51,085.07**	**68,626.44**	**94,441.73**	**132,013.96**	**173,513.77**	**256,146.66**	**348,389.75**
Cash outflows											
Capex											
Dyke Project	*3,041.24*	*18,825.61*	-	-	-	-	-	-	-	-	-
Railway	*515.51*	*3,539.33*	-	-	-	-	-	-	-	-	-
Road	*481.06*	*2,995.91*	-	-	-	-	-	-	-	-	-
Solar	*56.91*	*2,036.43*	-	-	-	-	-	-	-	-	-

Wind	*149.39*	*5,345.75*	-	-	-	-	-	-	-	-	-
Cash outflows from Capex	**4,244.11**	**32,743.03**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
O&M Expenses											
Dyke Project	-	-	5,580.21	7,121.91	9,089.57	11,600.85	14,805.95	18,896.56	24,117.33	30,780.50	37,413.89
Share of Railways	-	-	79.32	177.87	316.78	523.05	794.70	1,141.27	1,615.29	2,247.50	2,918.00
Railway	-	-	*531.30*	*531.30*	*531.30*	*531.30*	*531.30*	*531.30*	*531.30*	*531.30*	*531.30*
Road	-	-	*175.95*	*203.98*	*236.46*	*274.13*	*317.79*	*368.40*	*427.08*	*495.10*	*557.24*
Solar	-	-	*153.34*	*185.13*	*223.51*	*269.84*	*325.79*	*393.33*	*474.88*	*573.33*	*666.60*
Wind	-	-	*402.50*	*485.95*	*586.70*	*708.34*	*855.19*	*1,032.50*	*1,246.56*	*1,504.99*	*1,749.82*
Cash outflows from O&M Expenses	**-**	**-**	**6,922.62**	**8,706.13**	**10,984.32**	**13,907.50**	**17,630.72**	**22,363.35**	**28,412.43**	**36,132.72**	**43,836.85**
Financing Expenditure											
Dyke-Principal	-	-	*3,695.81*	*3,695.81*	*3,695.81*	*3,695.81*	-	-	-	-	-
Dyke-Interest	-	-	*4,324.10*	*3,215.35*	*2,106.61*	*997.87*	-	-	-	-	-
Railway-Principal	-	-	*460.23*	*460.23*	*460.23*	*460.23*	-	-	-	-	-
Railway-Interest	-	-	*897.46*	*667.34*	*437.22*	*207.11*	-	-	-	-	-
Road-Principal	-	-	*404.44*	*404.44*	*404.44*	*404.44*	-	-	-	-	-
Road-Interest	-	-	*788.67*	*586.44*	*384.22*	*182.00*	-	-	-	-	-
Solar-Principal	-	-	*197.52*	*197.52*	*197.52*	*197.52*	-	-	-	-	-
Solar-Interest	-	-	*385.15*	*286.40*	*187.64*	*88.88*	-	-	-	-	-
Wind-Principal	-	-	*518.48*	*518.48*	*518.48*	*518.48*	-	-	-	-	-
Wind-Interest	-	-	*1,011.03*	*751.79*	*492.55*	*233.31*	-	-	-	-	-
Cash outflows from P+I	**-**	**-**	**12,682.89**	**10,783.81**	**8,884.73**	**6,985.65**	**-**	**-**	**-**	**-**	**-**
Total cash outflow	**4,244.11**	**32,743.03**	**19,605.50**	**19,489.94**	**19,869.05**	**20,893.15**	**17,630.72**	**22,363.35**	**28,412.43**	**36,132.72**	**43,836.85**
Net cash flow before tax	**-**	**-**	**12,000.16**	**19,989.45**	**31,216.02**	**47,733.29**	**76,811.01**	**109,650.61**	**145,101.34**	**220,013.94**	**304,552.90**
Taxes											
Dyke	-	-	-	1,692.98	3,383.95	5,509.39	8,590.33	13,202.12	17,439.91	30,094.21	45,928.61

Railway	-	-	-	*(0.00)*	*1,521.56*	*2,831.10*	*4,495.65*	*6,537.42*	*9,341.71*	*13,089.39*	*17,069.14*
Road	-	-	*369.68*	*1,147.42*	*2,022.64*	*3,116.56*	*4,567.47*	*6,375.16*	*8,407.14*	*10,994.74*	*12,565.73*
Solar	-	-	*400.17*	*468.86*	*514.66*	*545.92*	*580.27*	*563.27*	*542.74*	*517.96*	*494.49*
Wind	-	-	*310.22*	*490.51*	*610.73*	*692.81*	*742.58*	*714.49*	*670.38*	*611.10*	*552.33*
Total Tax	**-**	**-**	**1,080.07**	**2,106.78**	**4,669.59**	**7,186.38**	**10,385.97**	**14,190.34**	**18,961.97**	**25,213.19**	**30,681.70**
Net cash flow after tax	**-**	**-**	**10,920.09**	**17,882.67**	**26,546.43**	**40,546.91**	**66,425.04**	**95,460.27**	**126,139.37**	**194,800.75**	**273,871.21**

Table E5: Project cash flow profile for 50 years (Worst-case scenario)

Year	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2076
Cash Inflows from Operations and Financing											
Dyke Project											
Equity Inflows	*964.13*	*5,968.06*	-	-	-	-	-	-	-	-	-
Debt Inflows	*2,249.64*	*13,925.48*	-	-	-	-	-	-	-	-	-
Cash Inflow from Dyke	**3,213.77**	**19,893.55**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rail Project											
Equity Inflow	*163.99*	*1,125.89*	-	-	-	-	-	-	-	-	-
Debt Inflow	*382.64*	*2,627.08*	-	-	-	-	-	-	-	-	-
Fare Box Revenue from Passenger Traffic	-	-	*1,313.86*	*2,825.42*	*4,939.37*	*8,281.48*	*12,709.27*	*18,368.50*	*26,402.03*	*37,281.22*	*48,912.43*
Freight revenue (with RORO)	-	-	*89.54*	*245.10*	*486.37*	*751.78*	*1,089.40*	*1,515.49*	*1,991.12*	*2,511.92*	*2,980.01*
Freight revenue (without RORO)	-	-	*99.49*	*299.56*	*576.44*	*877.08*	*1,258.86*	*1,740.01*	*2,212.36*	*2,791.03*	*3,396.03*
Non-Fare box revenue	-	-	*328.46*	*706.36*	*1,234.84*	*2,070.37*	*3,177.32*	*4,592.13*	*6,600.51*	*9,320.30*	*12,228.11*
Cash Inflows from Rail	**546.63**	**3,752.97**	**1,831.36**	**4,076.43**	**7,237.01**	**11,980.70**	**18,234.85**	**26,216.13**	**37,206.01**	**51,904.47**	**67,516.57**
Road Project											
Equity Inflows	*153.06*	*953.25*	-	-	-	-	-	-	-	-	-
Debt Inflows	*357.15*	*2,224.24*	-	-	-	-	-	-	-	-	-
Toll Revenue	-	-	*3,347.53*	*5,136.13*	*7,527.47*	*10,659.64*	*14,814.05*	*19,941.03*	*25,328.79*	*31,796.73*	*35,096.95*
Non Fare Box Revenue	-	-	*463.38*	*824.20*	*1,400.33*	*2,298.85*	*3,703.63*	*5,779.47*	*8,510.22*	*12,384.97*	*15,386.17*
Cash Inflows from Road	**510.21**	**3,177.49**	**3,810.91**	**5,960.33**	**8,927.80**	**12,958.49**	**18,517.68**	**25,720.49**	**33,839.01**	**44,181.70**	**50,483.13**
Solar Project											
Equity Inflow	*18.04*	*645.56*	-	-	-	-	-	-	-	-	-
Debt Inflow	*42.09*	*1,506.31*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*2,492.71*	*2,492.71*	*2,492.71*	*2,492.71*	*2,492.71*	*2,492.71*	*2,492.71*	*2,492.71*	*2,492.71*

Cash Inflows from Solar	**60.14**	**2,151.87**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**	**2,492.71**
Wind Project											
Equity Inflow	*47.36*	*1,694.64*	-	-	-	-	-	-	-	-	-
Debt Inflow	*110.50*	*3,954.15*	-	-	-	-	-	-	-	-	-
Revenue	-	-	*3,757.18*	*3,757.18*	*3,757.18*	*3,757.18*	*3,757.18*	*3,757.18*	*3,757.18*	*3,757.18*	*3,757.18*
Cash Inflows from Wind	**157.86**	**5,648.78**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**	**3,757.18**
Availability of Fresh Water											
Seasonal irrigation	-	-	*380.28*	*430.25*	*486.79*	*550.75*	*623.13*	*705.01*	*797.66*	*902.48*	*996.16*
Perennial irrigation	-	-	*6.73*	*7.62*	*8.62*	*9.75*	*11.03*	*12.48*	*14.12*	*15.98*	*17.64*
Drinking water	-	-	*982.38*	*1,582.13*	*2,548.04*	*4,103.64*	*6,608.96*	*10,643.80*	*17,141.94*	*27,607.27*	*40,419.81*
Industrial use	-	-	*4,333.62*	*6,979.35*	*11,240.31*	*18,102.63*	*29,154.46*	*46,953.55*	*75,619.16*	*121,785.42*	*178,306.03*
Cash Inflows from Fresh Water	**-**	**-**	**5,703.02**	**8,999.35**	**14,283.75**	**22,766.78**	**36,397.58**	**58,314.84**	**93,572.89**	**150,311.15**	**219,739.64**
Cash Inflow from Land Reclamation and Development											
Cash Inflows from Land	**-**	**-**	**13,509.02**	**13,509.02**	**13,509.02**	**13,509.02**	**13,509.02**	**13,509.02**	**-**	**-**	**-**
Cash Inflow from Fisheries Development											
Cash Inflows from Fisheries	**-**	**-**	**52.51**	**110.69**	**128.32**	**148.76**	**172.45**	**199.92**	**231.76**	**268.67**	**302.39**
Cash Inflow from Employment											
Cash Inflows from Employment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Cash Inflows from Operations and Financing	**4,488.60**	**34,624.66**	**31,156.71**	**38,905.71**	**50,335.80**	**67,613.63**	**93,081.47**	**130,210.29**	**171,099.55**	**252,915.87**	**344,291.62**
Cash outflows											
Capex											
Dyke Project	*3,213.77*	*19,893.55*	-	-	-	-	-	-	-	-	-
Railway	*546.63*	*3,752.97*	-	-	-	-	-	-	-	-	-
Road	*510.21*	*3,177.49*	-	-	-	-	-	-	-	-	-
Solar	*60.14*	*2,151.87*	-	-	-	-	-	-	-	-	-
Wind	*157.86*	*5,648.78*	-	-	-	-	-	-	-	-	-

Cash outflows from Capex	**4,488.60**	**34,624.66**	-	-	-	-	-	-	-	-	-
O&M Expenses											
Dyke Project	-	-	5,896.76	7,525.92	9,605.20	12,258.94	15,645.86	19,968.52	25,485.45	32,526.61	39,536.30
Share of Railways	-	-	75.14	168.50	300.11	495.52	752.88	1,081.20	1,530.28	2,129.21	2,764.42
Railway	-	-	*556.60*	*556.60*	*556.60*	*556.60*	*556.60*	*556.60*	*556.60*	*556.60*	*556.60*
Road	-	-	*186.62*	*216.34*	*250.80*	*290.74*	*337.05*	*390.73*	*452.97*	*525.11*	*591.02*
Solar	-	-	*160.64*	*193.94*	*234.15*	*282.69*	*341.30*	*412.06*	*497.49*	*600.63*	*698.34*
Wind	-	-	*421.67*	*509.09*	*614.64*	*742.07*	*895.92*	*1,081.66*	*1,305.92*	*1,576.66*	*1,833.15*
Cash outflows from O&M Expenses	**-**	**-**	**7,297.43**	**9,170.40**	**11,561.49**	**14,626.56**	**18,529.60**	**23,490.77**	**29,828.70**	**37,914.82**	**45,979.82**
Financing Expenditure											
Dyke-Principal	-	-	*3,905.46*	*3,905.46*	*3,905.46*	*3,905.46*	-	-	-	-	-
Dyke-Interest	-	-	*4,569.39*	*3,397.75*	*2,226.11*	*1,054.48*	-	-	-	-	-
Railway-Principal	-	-	*488.02*	*488.02*	*488.02*	*488.02*	-	-	-	-	-
Railway-Interest	-	-	*951.63*	*707.62*	*463.61*	*219.61*	-	-	-	-	-
Road-Principal	-	-	*428.96*	*428.96*	*428.96*	*428.96*	-	-	-	-	-
Road-Interest	-	-	*836.47*	*621.99*	*407.51*	*193.03*	-	-	-	-	-
Solar-Principal	-	-	*208.71*	*208.71*	*208.71*	*208.71*	-	-	-	-	-
Solar-Interest	-	-	*406.99*	*302.63*	*198.28*	*93.92*	-	-	-	-	-
Wind-Principal	-	-	*547.87*	*547.87*	*547.87*	*547.87*	-	-	-	-	-
Wind-Interest	-	-	*1,068.34*	*794.41*	*520.47*	*246.54*	-	-	-	-	-
Cash outflows from P+I	**-**	**-**	**13,411.84**	**11,403.42**	**9,395.01**	**7,386.59**	**-**	**-**	**-**	**-**	**-**
Total cash outflow	**4,488.60**	**34,624.66**	**20,709.27**	**20,573.82**	**20,956.50**	**22,013.15**	**18,529.60**	**23,490.77**	**29,828.70**	**37,914.82**	**45,979.82**
Net cash flow before tax	**-**	**-**	**10,447.44**	**18,331.88**	**29,379.30**	**45,600.48**	**74,551.87**	**106,719.52**	**141,270.86**	**215,001.04**	**298,311.79**
Taxes											
Dyke	-	-	-	1,466.05	3,177.25	5,301.84	8,362.60	12,922.66	17,089.86	29,651.35	45,392.20
Railway	-	-	-	*(0.00)*	*1,406.86*	*2,658.90*	*4,243.90*	*6,179.17*	*8,836.29*	*12,386.92*	*16,157.28*

Road	-	-	*333.95*	*1,126.04*	*2,009.03*	*3,107.76*	*4,561.81*	*6,369.18*	*8,400.46*	*10,987.12*	*12,557.19*
Solar	-	-	*350.81*	*423.46*	*471.94*	*505.09*	*541.51*	*523.70*	*502.20*	*476.23*	*451.64*
Wind	-	-	*219.60*	*410.30*	*537.57*	*624.57*	*677.50*	*648.23*	*602.10*	*540.05*	*478.51*
Total Tax	**-**	**-**	**904.35**	**1,959.79**	**4,425.41**	**6,896.32**	**10,024.72**	**13,720.27**	**18,341.05**	**24,390.32**	**29,644.63**
Net cash flow after tax	**-**	**-**	**9,543.09**	**16,372.09**	**24,953.89**	**38,704.16**	**64,527.15**	**92,999.25**	**122,929.80**	**190,610.72**	**268,667.16**

Annexure F: Shadow Cost Factor Approach to Economic Analysis

Methodology adopted for Economic Feasibility of Kalpasar Project

a) Net Economic Benefit

Economic appraisal is done by estimating net project gains by comparing the 'With Kalpasar' scenario and 'Without Kalpasar' scenario. Stream of costs and benefits, as estimated in market values are then converted into economic values by using appropriate shadow cost factors.

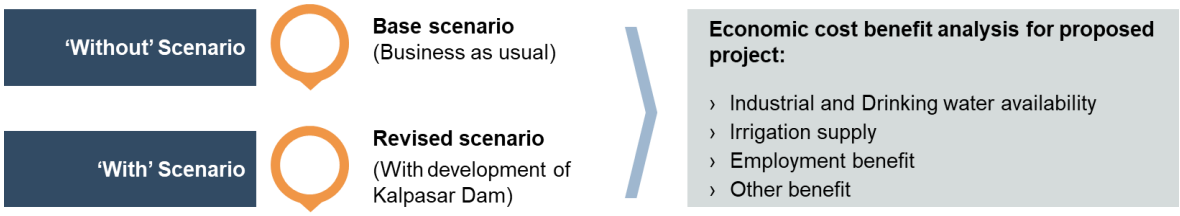
The annual stream of project costs and benefits are compared over the entire analysis period for estimating the net benefit and economic viability of the project. These benefits are presented in terms of the Economic Internal Rate of Return (EIRR).

EIRR represents the discount rate at which ENPV of the project is equal to zero; in other terms where the Net Present Value of all economic cash flows is equal to zero. The higher the value of EIRR, the greater the net economic returns from the project.

b) Economic assessment – Approach and framework

As highlighted, economic cost-benefit analysis analyses overall costs and benefits from the development of the Kalpasar Dyke. The assessment includes monetizing non-market benefits from the development of the dyke, such as availability of water drinking, industrial, and irrigational purposes, hydropower generation, employment generation, travel time savings, decongestion benefits, environmental impact savings, etc.

Figure G.1: Economic Analysis: Without and With Scenarios



Economic appraisal of this project evaluates social cost-benefit and compares project benefit and costs under "With" and "Without" project cases.

"With" case considers the possible benefits achieved with the development of Kalpasar Dyke whereas "Without project" case considers the existing base case. The Economic Internal Rate of Return (EIRR) would be calculated as-

EIRR = Private Returns + Cost Gains

Where, Private Returns = Actual Revenues – Actual Costs

Cost Gains = Actual Cost – Opportunity Cost

All taxes and subsidies are excluded from the computation of EIRR

The financial analysis only looks at the project from the perspective of the implementing agency. Also, financial analysis is only concerned with line items that entail monetary outlays. Economic analysis, on the other hand, considers cost and associated benefits to the economy.

Economic analysis requires quantification of various costs and benefits converted to 'economic equivalent' terms. EIRR also requires identification of 'externalities and valuation of inputs and outputs at their true economic prices, or the 'opportunity costs'. These externalities would be estimated as the Shadow Cost Factor, as explained in the following Section.

Shadow Price Approach: Indicative Methodology pertinent to the Kalpasar Project

The key concept is the use of shadow prices to reflect the social opportunity cost of goods and services, instead of prices observed in the market, which may be distorted. Sources of market distortions are manifold.

Non-efficient markets where the public sector and/or operators exercise their power (e.g., subsidies for energy generation from renewable sources, prices including a mark-up over the marginal cost in the case of monopoly, etc.).

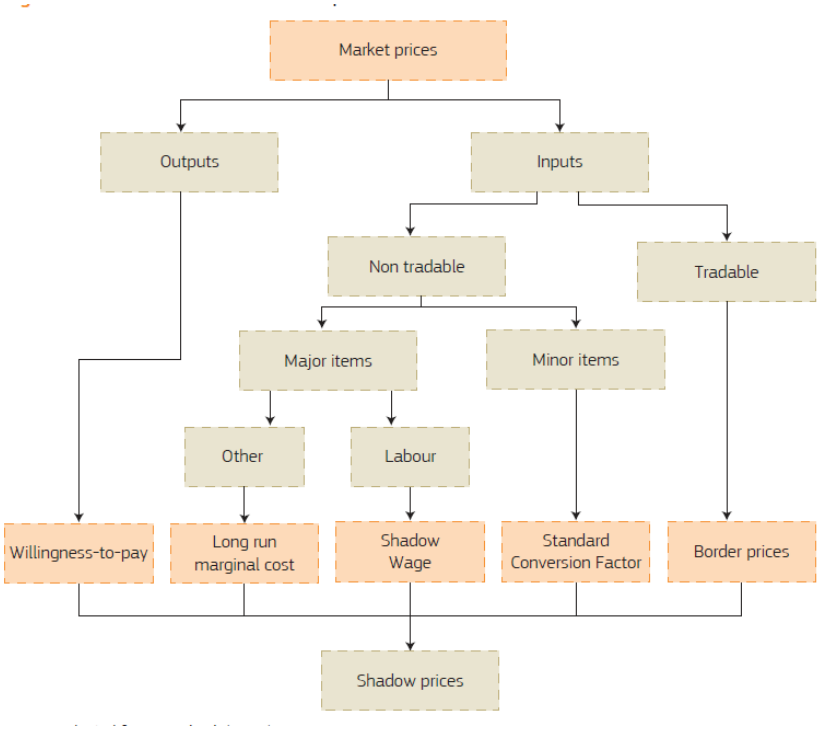
Administered tariffs for utilities may fail to reflect the opportunity cost of inputs due to affordability and equity reasons.

Some prices include fiscal requirements (e.g. duties on import, excises, VAT and other indirect taxes, income taxation on wages, etc.).

For some effects, no market (and prices) are available (e.g. reduction of air pollution, time savings).

In such cases, the standard approach to economic analysis is the conversion from market prices to shadow prices. A simplified operational approach for the estimation of the shadow prices is presented in the schematic below:

Figure G.2: Estimation of Shadow Prices



Source: Guide to Cost-Benefit Analysis of Investment Projects (Economic appraisal tool for Cohesion Policy 2014-2020; adapted from Saerback (1990).

The approach can be adapted in the Kalpasar project as discussed in the subsequent section.

Shadow Cost Factor Estimation

In order to estimate the economic benefits of the Kalpasar Dyke, the actual financial value of construction and operational costs would be estimated including the Shadow Cost Factor. The Shadow Prices are adjusted financial prices, which discount the effects of government taxation and subsidies, the opportunity cost of resources, environmental externalities, and market distortions.

The Shadow Exchange Rate Factor determines the domestic currency value converted at the official exchange rate, and as per the Asian Development Bank's (ADB) guidelines, it is determined as per the formula below.

SERF = RER / OER * (1 + T – S)

Where, SERF = Shadow Cost Factor

RER = Long-run Real Exchange Rate for the economy

OER = Original Exchange Rate (Actual) of the economy

T = Average rate of tax on infrastructure investment, and

S = Average rate of subsidy on infrastructure investment

Shadow Wage Rate Factor (SWRF) determines the opportunity cost of labour. For skilled labour, SWRF is considered equal to 1, whereas, for unskilled labour, SWRF varies between 0-0.75 implying a loss of output.

The relevant shadow factors for the economic assessment of Kalpasar Dyke would be derived using the ADB or similar Guidelines.

Shadow Cost Factor Estimation (SCFE) approach to economic analysis

This approach entails the following steps. (1) Conversion of Financial Project Cost Estimates into economic costs; (2) Conversion of Opex estimates into economic costs; (3) Identification of tangible economic benefits accruing due to the project; (4) Quantification of the tangible economic benefits based on sound economic principles; and finally (5) Conducting an economic analysis of the Present Value of Economic Benefits and Economic Return from the project.

The socio-economic impact of the project can be classified into tangible and intangible benefits. The tangible benefits (or tangible outputs) can be further classified as Traded and Non Traded Outputs in the nature of Incremental and Nonincremental outputs. Similarly, inputs or project (and associated) costs can be classified as Traded/Non Traded, further classified into Incremental and Nonincremental inputs.

Economic cost-benefit analysis establishes the overall economic merit of the project. Economic assessment includes monetizing benefits, such as time savings, decongestion benefits, environmental impact, accident cost savings, etc. This analysis is the central tool for measuring the net economic gain that can be achieved through the development of the project.

Economic valuation of project benefits and costs involves converting their financial values into economic values, also known as “shadow pricing.” This conversion requires economic prices of project outputs and inputs to be estimated. Economic prices reflect values of goods, services, and other project effects on the national economy. The basis for estimating economic prices differs between internationally traded and nontraded goods and services, between project outputs and inputs, and between incremental and non-incremental outputs and inputs.

Based on the above principles, input costs and outputs shall be converted into shadow prices. Further analysis and calculation of EIRR / ENPV follows the same method as is used for the calculation of FIRR.

Economic Internal Rate of Return (EIRR) will be computed based on sound economic principles and globally accepted norms of conducting Economic Analysis of the Project (also known as Social Cost Benefit Analysis) to arrive at the economic feasibility of the project. The EIRR indicates the rate of return at which the present value of the economic costs and benefits of the project are equal. In other words, it is the discount rate for which the net present value of the net effect on the economy (ENPV) is zero. The EIRR should be compared with the socially required rate of return. Projects that are found to have an EIRR that is higher than the socially required rate of return would be said to be feasible economic investments. These may then proceed for a detailed analysis of their viability as PPPs.

FIRR and EIRR give different sorts of information about a project. FIRR provides a decision criterion on whether the project generates enough return to cover the cost of funds (or in other words generates a positive Net Present Value of Net Cash Flow during the project period) On the other hand, the EIRR is better suited to being a decision criterion from the socially beneficial purpose. By allowing a project to be compared against a required rate of return it gives a yes or no answer about whether it is economically feasible. EIRR includes aspects such as socio-economic perspective and positive and negative externalities of the project to society.

Annexure G: PPP and Transaction Structures

A Public-Private Partnership (PPP) is a contractual agreement between public entities (national, state, provincial, or local) and private entities, where the skills, assets, and/or financial resources of both sectors are utilized in a complementary manner. This arrangement shares the risks and rewards, aiming to provide citizens with optimal service delivery and value.

PPP differs significantly from conventional public procurement as it places the burden of raising funds on the private entity. In the PPP structure, the private entity is primarily responsible for finding investors and creating the project's financing structure. However, the government is affected by the private party's participation in such important public initiatives. The following crucial components are a part of the PPP project implementation mode:

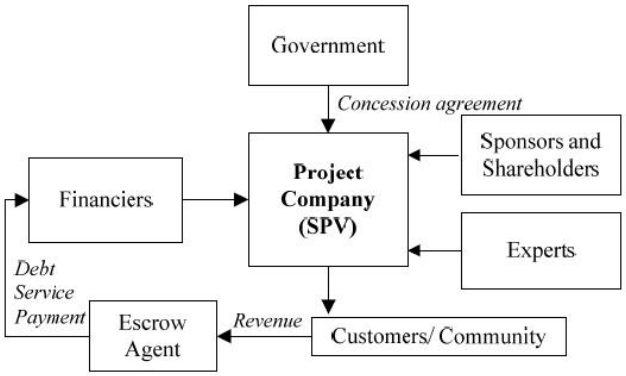
1. **Duration:** Typically, agreements between public and private sector partners are medium to long term and frequently span the entire life of the asset created under the PPP agreement.

2. **Financing, responsibilities, and ownership**. Asset financing by the public and/or private sector is often intricate and can involve earnings from the operation of the asset over a set period. The obligations of the private partner can often include the commodity's creation, management, and upkeep. Depending on the PPP arrangement, the ownership of the commodity varies. In some cases, the private sector operator owns the asset and transfers ownership to the public sector partner after a designated period. In other cases, ownership may be shared or retained by the public sector partner over the asset's life.

3. **Performance-based returns.** PPPs develop assets or projects to deliver ongoing services to the public, rather than the asset being the deliverable of the contract, with payment being contingent on the operator of the asset meeting performance standards. Typically, the public sector partner is in charge of keeping track of results throughout the contract.

4. **Output and quality specification.** The private sector collaborator participates in project phases defined by the public sector partner. (e.g., design, construction, operation, maintenance, and financing). The public sector partner specifies the desired general welfare, service excellence, and pricing structure results.

Figure: A typical structure of the PPP project



Source: ADB Guide to PPP Projects

Public infrastructure is the systems and facilities necessary for the functioning of the economy and society. They serve as a means of supporting a nation's socioeconomic progress rather than an end in themselves and include facilities that are auxiliary to this end.

A Special Purpose/Project Vehicle (SPV) is a legal entity created to execute a specific project. All contractual agreements between the various parties are negotiated between themselves and the SPV. The SPV is a commercial enterprise formed under the relevant Act of a country by the shareholders or sponsors through an agreement, commonly referred to as the memorandum of association. The shareholders' agreement outlines the company's foundation, including its name, ownership structure, management control, authorized share capital, and the members' liabilities.

Public infrastructure can be categorized in two ways.

Economic infrastructure: Infrastructure critical for everyday economic activities, such as transportation and utility networks (such as water, sewage, and electricity), falls under the category of economic infrastructure

Social infrastructure: Social infrastructure includes amenities such as schools, hospitals, libraries, prisons, etc.; that is, infrastructure considered essential for the structure of society.

It is universally acknowledged that the state must be involved in providing public infrastructure for the following reasons:

- Such projects present significant externalities that the commercial sector cannot account for, such as the socioeconomic advancement of the lower strata of society. To make initiatives with significant "externalities"—i.e., general economic and social benefits—easily accessible as "public goods" even to those who lack the financial means to pay for them, public-sector intervention is necessary. (medical, education, transportation, etc.).

- Additionally, private markets frequently result in the competitive delivery of infrastructure. This process is often deemed ineffective and necessitates some form of public oversight to ensure the fair distribution of benefits, which are

critical for the holistic development of society and the economy. The objective is to guarantee that "Merit Goods" (such as education), which would be underprovided to vulnerable groups in a free competitive market, are offered at the lowest possible cost.

- In addition, considerable investments are necessary for large-scale infrastructure projects, and the returns are realized over an extended period. Consequently, raising private funds for such ventures without public-sector assistance is challenging.

- Building infrastructure needs a sizable upfront investment, on which only very long-term returns can be anticipated. Without some public-sector assistance, it might be challenging to raise private capital for this investment. In projects of such nature, competitive market pricing does not account for the socio-economic benefits and the externalities therein. Thus, it could be claimed that infrastructure should be provided by the government in cases where free market competition would cause behavior to change or result in the loss of socioeconomic advantages.

Finally, PPPs are also known as publicly-funded provisions for social service rendered by non-public sector organizations, including the voluntary (not-for-profit) sector and public funding of the private sector. It contains the following components.

- A long-term contract (a 'PPP Contract') between a public and a private sector party;

- Long-term involvement of private sector party; which mainly includes designing work, construction work, financing, and the operation of public infrastructure (the 'Facility');

- Payments under the PPP Contract to the private-sector party, made either by the public-sector party or by the users (the general public) as a fee or tax for using the Facility.

- The Facility remains in public-sector ownership or reverts to public-sector ownership at the end of the PPP Contract. In a few cases, the PPP Contracts may involve major upgrading of existing infrastructure rather than a 'greenfield' construction.

(a) Public Procurement Vs. PPP

The public-sector party to the PPP Contracts (the 'Public Authority'—also known by several other terms like the 'Public party', 'Public Entity', 'Government-owned Entity', 'Public Institution', 'Contracting Authority', or just the 'Authority') can be a central/state/regional government department, a local/municipal corporation, a government agency or any other institution which comes under the control of the public sector. At the same time, the private-sector party is generally a special-purpose-vehicle (SPV) company (also called the 'Project Company' or the 'Private Party') formed by the private parties explicitly to undertake the PPP Contracts. Here, it is notable that the relationship between the public and private parties cannot be a

partnership in the legal sense. It is purely contractual and based on the PPP Contracts' terms and conditions.

Therefore, A PPP is thus an option to the public sector procuring the Facility ('public sector procurement'), which uses money from tax revenues or public borrowing. A typical public-sector procurement (known as 'design-bid-build,' the Public Authority specifies and designs the Facility, solicits bids on the basis of this detailed design, and pays for the Facility's construction by a private-sector contractor.

The Public Authority finances the entire construction cost, including any cost overruns. The Public Authority is solely responsible for the Facility's operation and maintenance, and the contractor assumes no responsibility for the Facility's long-term performance once the (a relatively short) construction warranty has ended.

On the other hand, in a PPP, the Public Authority outlines its needs in terms of "outputs", that is public services the facility is to offer. However, they do no details instructions on how to render these services. To further ensure that the Facility meets the long-term output requirements, the private sector must design, finance, build, and operate it. Over the course of the PPP Contract (perhaps 25 years on average), the Project Company receives payments (referred to as "Service Fees") on a pre-agreed basis. These payments are meant to pay back the financing expenses and provide investors with a return. In general, there is no additional allowance for cost overruns that happen during construction or operation of the Facility. Conversely, the Service Fees are subject to deductions for failing to fulfill output standards.

The result of this PPP approach is that significant risks relating to:

- The cost of designing and construction of the Facility
- Market demand for the Facility (usage)
- Service provided by the Facility (including its availability for use)
- The operation and maintenance expenditures of the Facility are handed over from the Public Authorities to the Project company.

In order to boost the project's viability and enable significant participation from the private sector, a variety of ownership and finance structures are constructed with the aid of the PPP mode of procurement. Here, a variety of these structures are discussed.

(b) BOO—BOT—BTO—DBFO-Franchise-Public Procurement

The figure below summarizes the various methods of providing public infrastructure outlined above, along with how PPPs fall on the spectrum from completely public-sector projects (and risk) to fully owned private-sector projects.

Figure: Structure of PPP projects: Public procurement-> Private Ownership

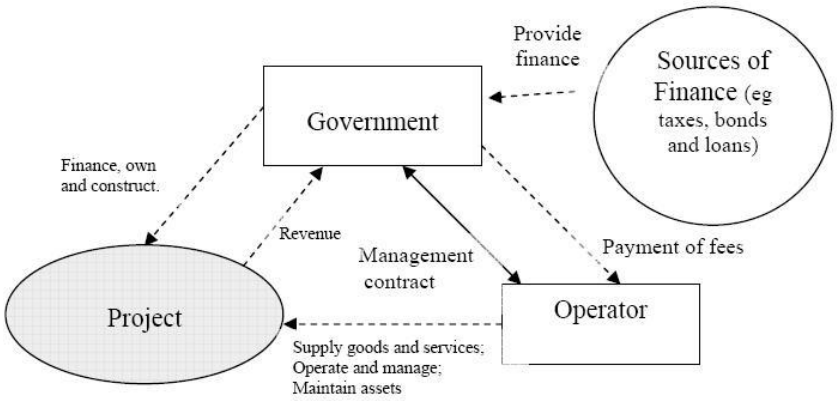
Public and private provision of infrastructure

	Public project ←					→ Private project
		← Public–Private Partnership →				
Contract Type	**Public-sector procurement**	**Franchise (*Affermage*)**	**Design-Build Finance-Operate (DBFO)***	**Build-Transfer-Operate (BTO)****	**Build-Operate-Transfer (BOT)*****	**Build-Own-Operate (BOO)**
Construction	Public sector[2]	Public sector[2]	Private sector	Private sector	Private sector	Private sector
Operation	Public sector[3]	Private sector	Private sector	Private sector	Private sector	Private sector
Ownership[1]	Public sector[4]	Public sector	Public sector	Private sector during construction, then public sector	Private sector during Contract, then public sector	Private sector
Who pays?	Public sector	Users	Public sector or users	Public sector or users	Public sector or users	Private-sector offtaker public sector[5], or users
Who is paid?	n/a	Private sector	Private sector	Private sector	Private sector	Private sector

Source: Y.R. Enscombe (2007, Ch 1)

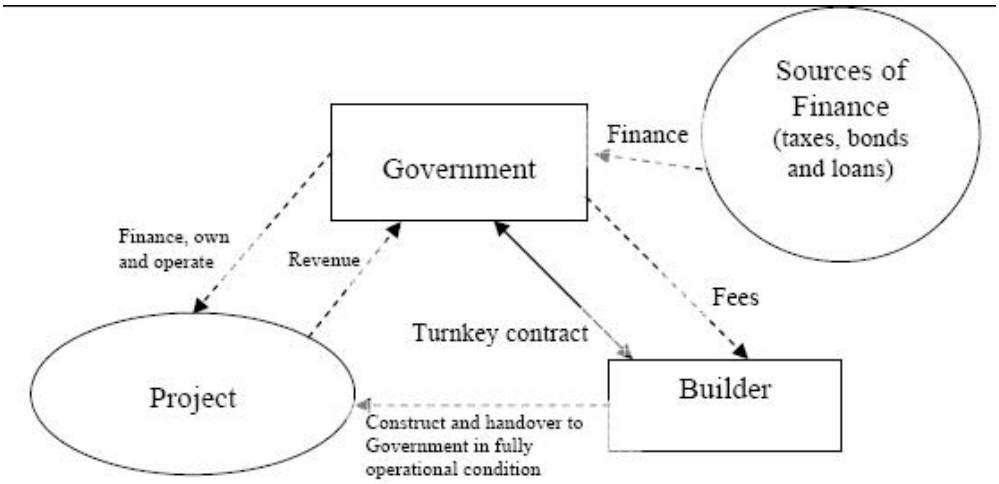
At one extreme we have the complete ownership and control of operations by the public sector often referred to as public procurement. Management and supply contracts, operations and maintenance management, and turnkey contracts are included in this. The contracts posits the following advantages: They are quick to put into practice. Compared to all other potential contract structures, they are the least complicated. Nonetheless, the following disadvantages exist. Efficiency gains are lower, and the private sector has fewer incentives to invest. Public sector is more likely to bear the majority of the risk. They don't work well for constructing greenfield assets.

Figure: Public Procurement: Management Contracts



Source: UN Primer to PPP projects

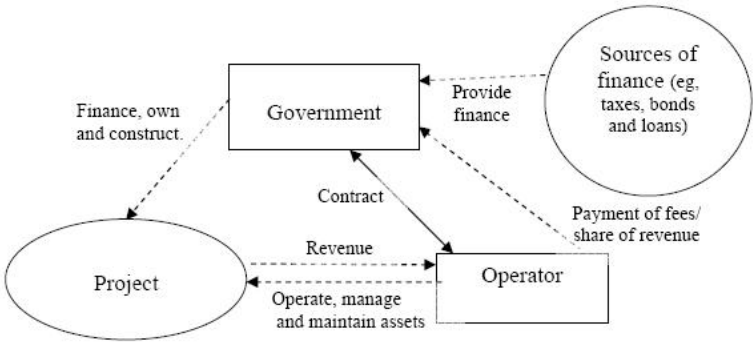
Figure: Public Procurement: Turnkey contract



Source: UN Primer to PPP projects

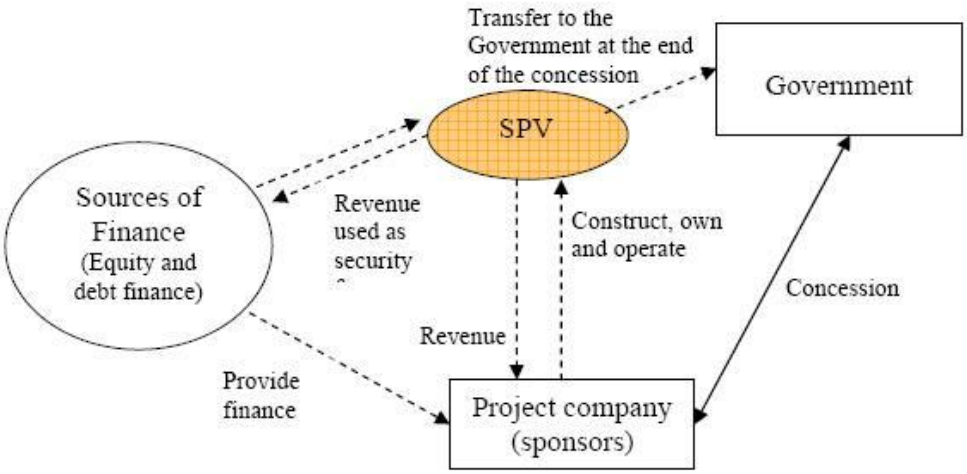
Next structure with significant control of public sector is affermage (or Franchise) which is blend of ownership by public sector and service management by private sector. Affermage (lease) contracts, as opposed to management contracts and turnkey contracts, give incentives to the private sector to invest in assets through long-term contracts.

Figure: Afterimage/Lease contract



Source: UN Primer to PPP projects

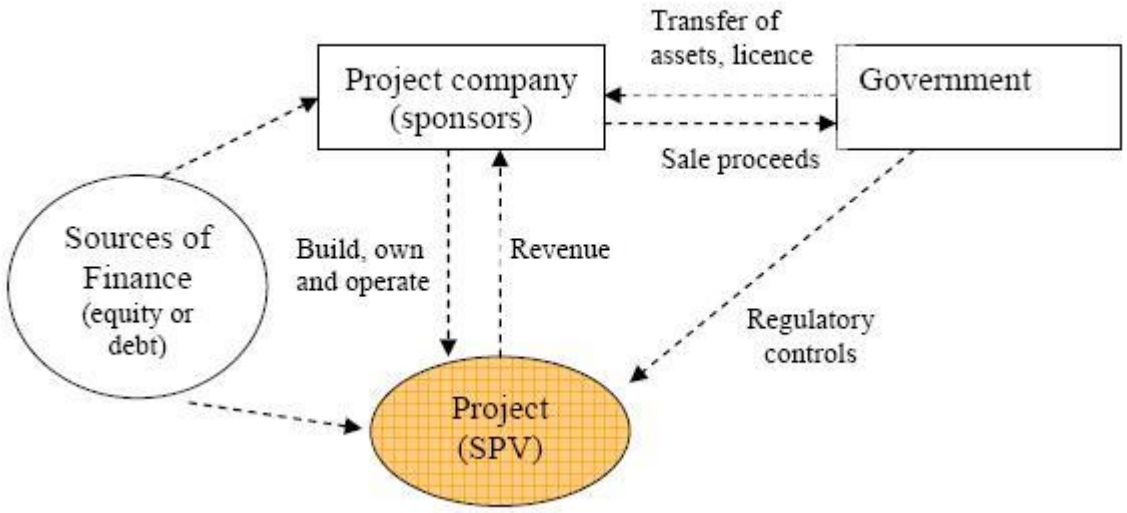
Figure: Concession Agreements



Source: UN Primer to PPP projects

Next, we have the BOT/BTO model, in which public parties bear the risk and are responsible for payments (rather than end-users). Then there is DBFOT/DBFO, which is prominent in developing nations. Under this, the private sector takes charge of designing, investing, plans, building the infrastructure. It also collects fees from end users (or, in certain situations, from the public offtaker); assumes the risk associated with the demand; and ensures that the output requirements are met. The facility is handed to public-sector ownership at the end of the concession period.

Figure: Private Ownership of Assets



Source: UN Primer to PPP projects

At the opposite side of the spectrum, we have a comprehensive BOO structure which results in the facility's privatization. The private firm controls the ownership structure. The public sector only serves as a regulator, policymaker, and monitoring authority to guarantee that a service or item is delivered to the public at a specific standard of quality and at prices that provide an acceptable (but not abnormal) return to the private party. As a result, an acceptable trade-off between competitive pricing and monitoring the provision of socioeconomic advantages to lower socioeconomic strata of society is ensured. Increasing private ownership provides the following advantages. First, the private sector carries substantial risks and provides higher incentives for long-term investment. Second, involvement of private sector increases the probability of higher efficiency and innovation as compared public sector. However, excess involvement of private sector also comes with certain disadvantages. These types of structures are difficult to establish contractually. Significant regulatory control is necessary. Government is projected to incur contingent liabilities in the medium to long term.

The PPP was first designed as a 'Build-Own-Operate' (BOO) contract between private-sector parties. Under this the possession of the Facility lies with the investors.

With the time it was clear to use similar structure for the construction of public sector projects. The "Build-Operate-Transfer" (BOT) contract model was first developed in Turkey, but with the important distinctions that the offtaker (purchaser) would be a Public Authority, the state ownership. At contract end, possession of facility could be transferred to the offtaker, i.e., public sector from the investors. The possession could be passed usually for a nominal amount or no cost.

BTO contract and DBFO contract were only a short distance apart from BOT model. 'Build-Transfer-Operate' (BTO) contract, where possession is handed over to the public authority on contract completion and the 'Design-Build-Finance-Operate' (DBFO) contract, where possession of the facility is not transferred throughout the contract and remains with public authority only, Instead of owning physical assets, the private sector's stake in the project is purely dependent on its contractual rights to operate the Facility and earn money from the offtaker for doing so.

BOT, BTO, and DBFO contracts allowed cash-strapped state utilities in developing nations to invest in more efficient facilities without giving up control over the facility, how it was delivered to customers, or how much it cost. In other words, the private sector facilitates the service on behalf of the public sector, but it was still entirely under the umbrella of public-sector.

(c) PPP contract types

Most PPP projects have contractual duration of 20-30 years, some have shorter spans whereas few lasts for long than 30 years. The term should always be long enough for the private party to have the incentive to integrate service delivery costs considerations into the design phase of the project. in order to maximize the trade-offs between initial investment cost and future maintenance and operation expenses, this also incorporates maintenance considerations.

The "whole-life" approach maximizes service delivery efficiency by taking into account whole-life costs and benefits. This is one of key reason for using PPPs to deliver public services. Project type and policies are key factors that determine the precise length of contract. Policymakers must be satisfied that the demand for the services delivered by the project will be sustained for the duration of the contract; the private party must accept responsibility for service delivery over the term of the contract; and the procuring authority must commit to the project for the duration of the contract. Finance availability and its terms and conditions to acquire may also have an impact on the term of the PPP contract.

Such contracts are built around three criteria. (a) The type of assets; (b) Functions of the private party; (c) How payments are made to the private party.

1. **Based on the Type of assets:** Construction of new – Greenfield assets can be included under PPP contracts. PPPs can also be used for brownfield projects, which involve handing over management and upkeep of existing assets to a private company. In any of the specified case, a crucial component of a PPP is that the assets or services provided are specified in terms of outputs. That is, level and quality of output or service should be pre-determined.

2. **Functions of the private party:** The fact that a PPP contract combines distinct project phases or roles is one of its key characteristics. Yet, depending

on the kind of asset and service being used, different duties are assigned to the private party. Some of key functions include Design (also known as engineering work) – includes project developed from the scratch, i.e., concept generation and output requirements to construction ready design specifications. **Build, or Rehabilitate –** However, using PPP for new infrastructure projects often requires private party to build the asset and setup and install the required equipment. In PPPs where existing assets are involved, the private party may oversee extending or rebuilding the asset. **Finance—**When a PPP calls for the construction or renovation of the asset, the private party is often also expected to fund all or a portion of the needed capital expenditure. **Maintain**— During the duration of the contract, the private party is responsible for maintaining an infrastructure asset to a stipulated standard. This is one of the key components of PPP contracts. **Operate**—Depending on the type of underlying asset and accompanying service, the private party's operating obligations under a PPP might vary greatly.

For instance, the private party might be held accountable for: Asset's technical operation and offering bulk services to government off-taker; and (b) Asset's technical operation and offering end user services; (c)creation of PPP entity, special purpose vehicle (SPV). It is possible to separate all assets and liabilities related to the private provision of services via a specialized SPV.

3. **Payment Mechanism:** The third distinguishing characteristic is the PPP payment mechanism. The government may pay the private party directly, through the collection of fees from users of the services, or through a mix of the two— With the common, defining trait that payment is conditional on performance. The functions of the private party may affect the available payment mechanisms: In **user-pays public-private partnerships (PPPs)**, such as toll roads, a private party offers customers a service and makes money by charging users for that service. Government payments may be used to supplement these fees (or tariffs, or tolls), such as additional payments for services rendered to low-income consumers when the tariff is capped, or subsidies to investment after the completion of construction or at particular construction milestones. Payments might be subject to the service's accessibility at a specified level of quality. Government funding is the only source of income for the private party under **government-pays PPPs**. Government payments may be conditional upon the availability of an asset or service at a contractually stipulated quality (availability payments); an example would be a free highway for which the government makes periodic availability payments. Alternatively, they could be volume-based payments for the services that users receive; for instance, compensation for successfully delivered hospital care.

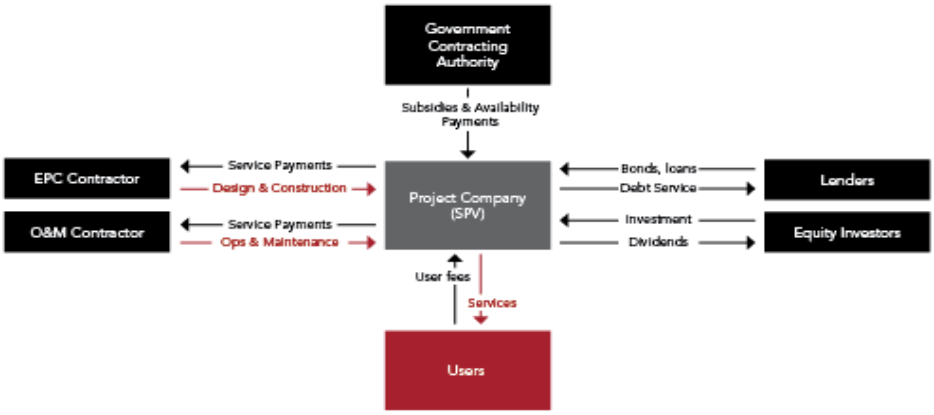
A variety of PPP contracts can be made by combining these traits in different ways. These contracts are viewed as a continuum between public and private provision of infrastructure, shifting increasing responsibilities and risk to the private sector. The payment method should be designed so that the private party's net compensation is related to performance. For the private party to have the right incentives to supply services at the performance levels envisaged by the procurement body, its remuneration, net-of-costs, should increase when reaching these levels. Also, contract cancellation should follow from persistently deviating significantly from the expected

performance levels, with termination payments made such that abandoning the project is never an easy option for the private party.

(d) Project Finance Transaction Structure of PPP Projects

Most PPP contracts have a private party that is a specific project company created for that purpose, often known as a Special Purpose Vehicle (SPV). This project company obtains funding by combining equity—provided by the project company's shareholders—and debt—provided by banks, or through bonds or other financial instruments. The financing structure consists of a mix of equity and debt as well as contractual arrangements between stock holders and lenders.

Figure: Typical Project Finance Structure with SPV Company



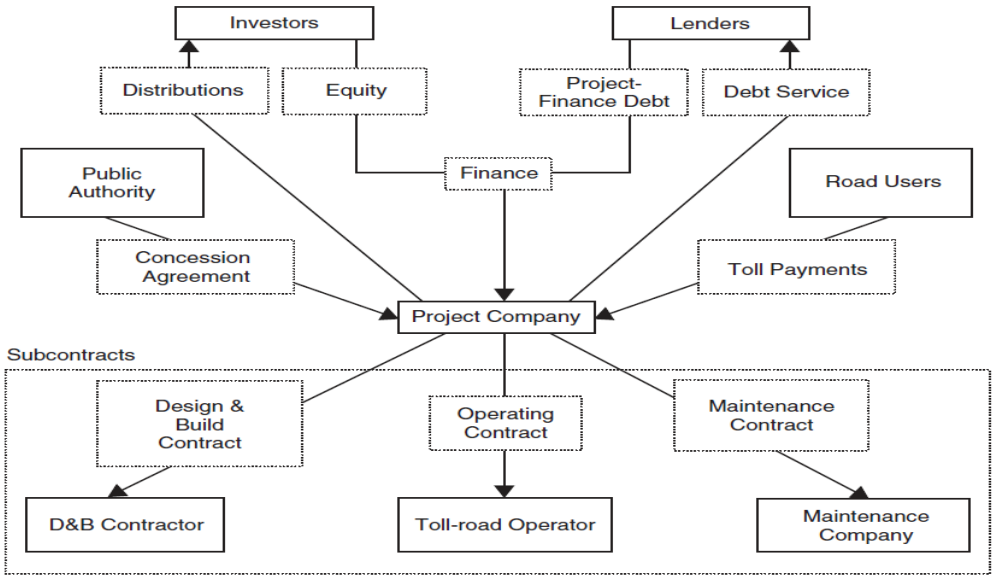
Source: World Bank primer on Project Finance

In the figure above, a typical PPP project structure is shown. The project company is the main party under contract with the government. A direct agreement between the contracting authority and the lenders may supplement this, albeit this relationship is often restricted to the lending arrangements specified in the PPP agreement, such as step-in rights or senior debt repayment guarantees.

Project shareholders are the initial equity investors who create the PPP proposal. Project developers, engineering or construction companies, infrastructure management companies, and private equity funds are examples of typical equity investors. In case of developing nations, commercial banks, multilateral and bilateral development banks, financial institutions, and institutional investors like pension funds and insurance firms may all lend money to PPP projects.

The project company (as shown in the Typical PPP Project Structure), enters into agreements with firms to oversee the facility's design and construction (often referred to as an Engineering, Procurement and Construction, or EPC contract), as well as operations and maintenance (O&M). These subcontractors can have connections to equity investors.

Figure: A Comprehensive Project Finance Structure for a Road Project



Source: E R. Yescombe Chapter 2007, Ch 1

The figure above displays a comprehensive road project financing arrangement. The following are the main components of this project finance structure. (a) A Project Company owned by investors from the private sector; (b) Financing for the project's capital costs (or "capex") through shareholder equity and project-finance debt; (c) A Design-and-Build contract ("D&B" contract), under which the contractor agrees to design and build the completed road and related works (such as toll booths) to the required specification, at a fixed price and schedule; and (d) An operating agreement, in which a toll operation company performs services like managing accidents, making minor repairs, and manning toll booths, etc.; (e) A maintenance agreement, through which a maintenance company maintains roads; (f) A concession agreement, which is the common name for this kind of PPP contract, with the public authority, that permits the collection of tolls from the users of roads but usually does not entail any payment from or to the Public Authority; (g) Cash flow after operating expenses (also known as "opex"), which mostly consists of payments made under operating and maintenance contracts and is used to pay distributions to the investors after paying for debt service.

The equity investment is "first in, last out," meaning that any project losses are first borne by the equity investors, and lenders only suffer if the equity investment is lost, as described in Farquharson et al's chapter on PPP financing (PPIAF 2001, 53). This implies that equity investors require a larger return on their investment because they incur a higher risk than debt lenders.

The project shareholders' and their advisors' primary concern when creating the finance structure is usually to keep the project's financing costs as low as possible. Project shareholders rely heavily on debt to finance the project because equity is more expensive than debt. This percentage may change from project to project based on the risks that the PPP operator assumes in each country.

The PPP project's financial modeling would adjust debt service and anticipated dividends in accordance with the anticipated flow of cash, which includes user fee and government payment revenue, building costs, and ongoing expenses, specifically for maintenance and operations.

(e) Hybrid Annuity Model (HAM) for PPP projects

The HAM concept has recently brought fresh innovation to the PPP market. By lowering the risk for project developers and banks, HAM is anticipated to quicken the pace of PPP project award and execution. This is due to the crucial variations in the flaws of the traditional toll and annuity-based DBFOT model, which HAM attempts to counter. The following are the key features of a HAM project.

1. **Bid Parameter:** The bid parameter is the project life cycle cost, which is calculated as the sum of the Net Present Value (NPV) of the quoted bid project cost and the NPV of the operations and maintenance (O&M) cost for the whole operating time. The developer submitting the lowest NPV for project life cycle cost wins the bid.

2. **Cash Construction Support:** The authority shall pay the concessionaire 40% of the bid project cost in five equal installments tied to the project's physical progress. 60% of the project's remaining costs must be initially covered by the concessionaire through a combination of debt and equity.

3. **Escalation clause in the project cost:** A Price Index Multiple (PIM), which is the weighted average of the Wholesale Price Index (WPI) and Consumer Price Index (CPI) (IW) in the ratio of 70:30, shall be used to index project costs for inflation. The bid project cost at the commencement of construction shall be the bid project cost adjusted for variation in the price index occurring between the reference index preceding the bid date and reference index date immediately preceding the appointed date. Bid project cost shall be changed to variation in PIM on monthly basis till the achievement of commercial operations date (COD).

4. **Stable cash flow of annuity payments:** After the project is completed, the Authority shall pay the concessionaire semi-annual annuity payments for the remaining 60% of the total project cost. The annuity payments are aligned with the normal revenue profile for highway projects. Interest on the reducing balance of the final construction cost shall be paid in annuity form in addition to the annuity payments. Interest will be charged at the bank rate plus 3%.

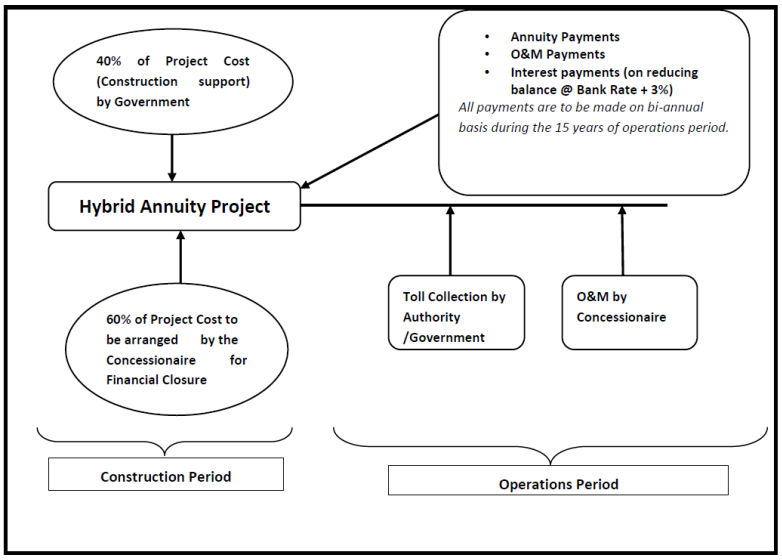
5. **Assured O&M payouts by authority:** The Authority shall make O&M payments and annuity payments to the concessionaire in accordance with the amount quoted, which will be inflation-indexed. Until the end of the concession period, the concessionaire is still in charge of project maintenance.

6. **Revenue for authority:** Toll collection shall be the responsibility and revenue of the authority.

7. **Concession Period:** It shall comprise construction period, which shall be project specific, with a fixed operations period of 15 years.

The following diagram provides an overview of HAM structure.

Figure: HAM model Block diagram



Source: Care Ratings evaluation of HAM, 2020

Compared to the traditional DBFOT model, this type of structure is anticipated to have the following benefits:

- **Concession period**: In HAM delinks annuities for operations and maintenance from the construction period. Hence, any delay in construction will not affect the stipulated O&M annuities. This is in contrast to typical DBFOT, where a fixed concession term results in lower annuities if construction is delayed.

- **Damages for Delays:** Concessionaire will be required to pay higher damages (0.2%-0.3%) in HAM than in DBFOT (0.1%) for project delay in commercial operation date (COD).

- **Project cost as bidding criteria:** Low possibilities of deviations in stipulated project cost because project cost is also a key bidding factor.

- **Construction grant** linked to the physical progress, which amounts to 40% of the project cost. This is expected to provide a significant funding cushion.

- In addition, other clauses, such as those relating to deemed termination for excessive delay in project award, project milestones linked to physical and financial progress, provision of mobilization advances up to 10% of bid project cost, bonus payment on early completion, termination payment under concessionaire event of default, among others, are anticipated to bring more transparency and visibility of the project scope and expected benefits and penalties and more certainty to implementation.

Thus, HAM structure is expected to reduce the following risks.

- **Funding risk**: HAM model eases developer funding requirements by taking into account 40% construction support from authority. Mobilization advances up to 10% of bid project cost are expected to provide further padding. Overall, this lowers the project's funding risk.

- **Project Implementation risk**: Clauses like 80% availability of project land before the appointed date, deemed termination, which is further supported by construction grants and mobilization advances, are expected to lower the risk associated with implementing the project.

- **Cash flow risk**: Annuity payments from the authority and 60% of the project cost in the form of semi-annuities at a rate of Bank+3% are anticipated to somewhat alleviate the risk of cash flow during O&M.

- **O&M risk**: O&M risk is significantly countered by fixed annuity payments that are inflation-indexed.

- **Interest rate risk**: As per HAM, interest annuity is paid on reducing balance of bid-project cost at Bank+3%, thus reducing the interest rate risk to an extent.

(f) PPP Projects in India

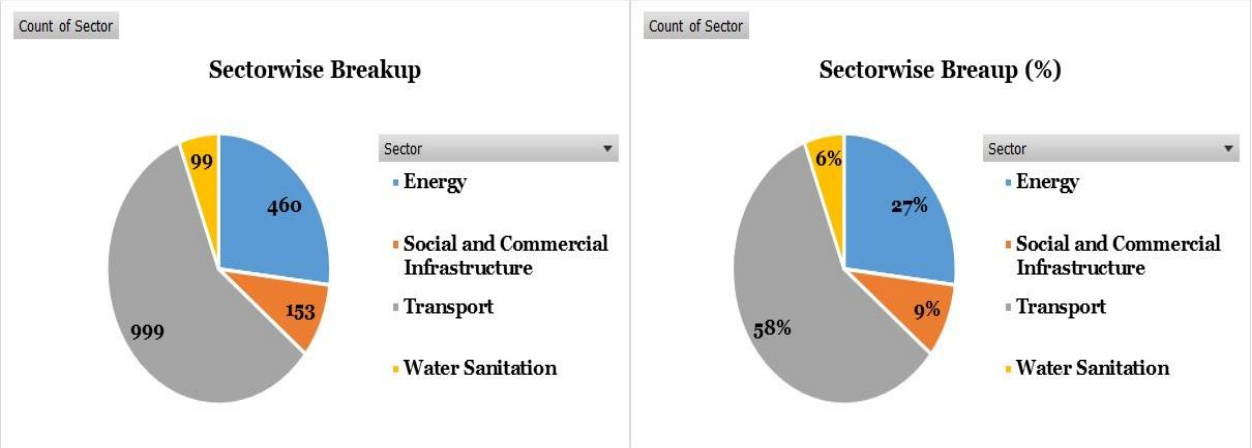
We survey more than 1700 projects from the Department of Economic Affairs (GoI) website on PPP infrastructure projects in India. This data includes the project PPP structure, location, and sector. The following analysis is obtained.

Table: Sector-wise distribution of projects

Sector	Count of Sector
Energy	460
Social and Commercial Infrastructure	153
Transport	999
Water Sanitation	99
Grand Total	**1711**

Sector-wise breakup suggests that majority of PPP projects (~58%) are carried out in transport sector (railways and road). Other segment that have witnessed considerable growth in PPP projects, include Energy (27%), Water sanitation related projects (9%), and social and commercial infrastructure (6%).

Figure: Sector-wise breakup of PPP Projects



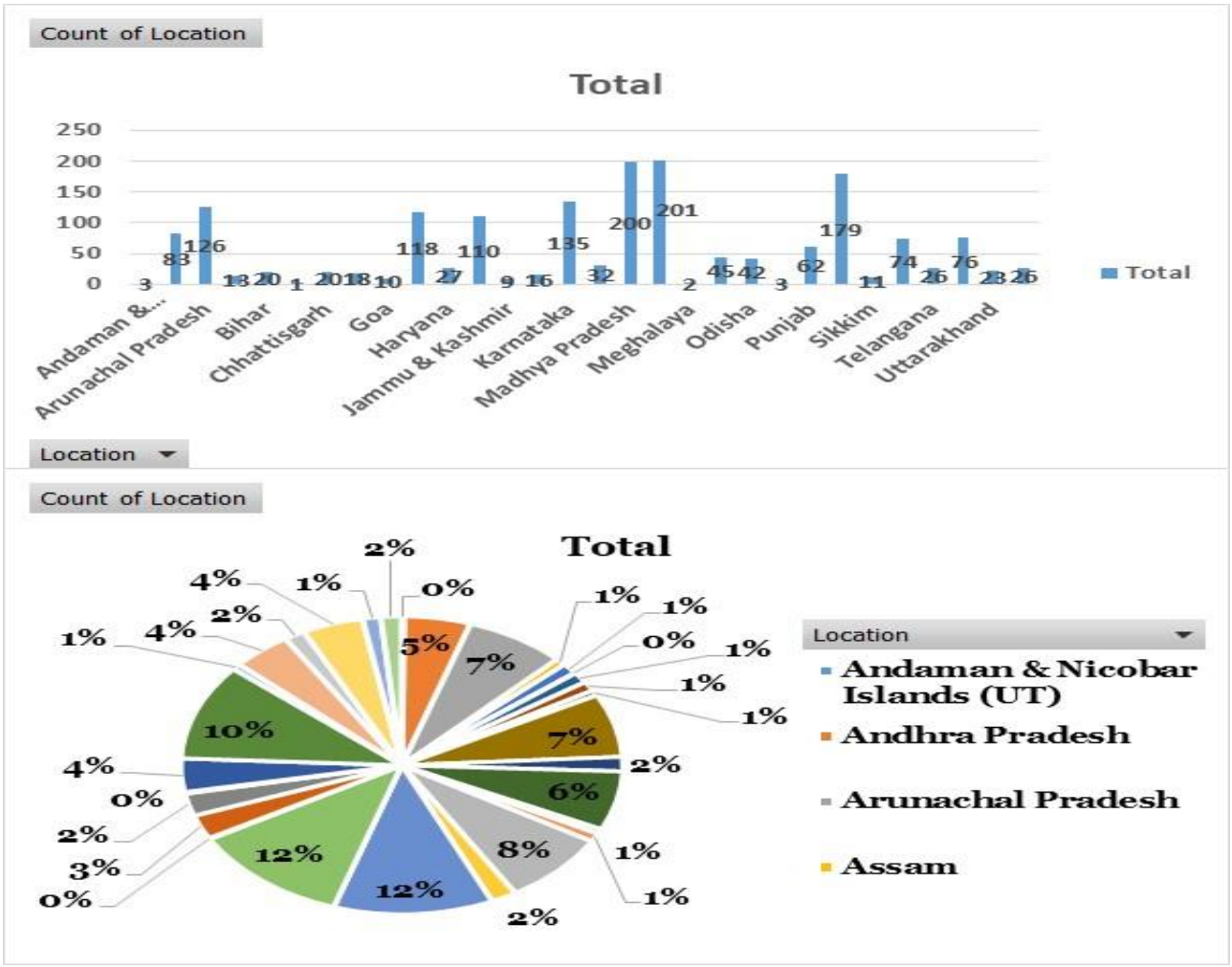
Source: Dept. of Economic Affairs (GoI)

Table: Geography-wise distribution of projects

State	Count
Andaman & Nicobar Islands (UT)	3
Andhra Pradesh	83
Arunachal Pradesh	126
Assam	13
Bihar	20
Chandigarh (UT)	1
Chhattisgarh	20
Delhi (UT)	18
Goa	10
Gujarat	118
Haryana	27
Himachal Pradesh	110
Jammu & Kashmir	9
Jharkhand	16
Karnataka	135
Kerala	32
Madhya Pradesh	200
Maharashtra	201
Meghalaya	2
Multi State/ Centre	45
Odisha	42
Puducherry (UT)	3
Punjab	62

Rajasthan	179
Sikkim	11
Tamil Nadu	74
Telangana	26
Uttar Pradesh	76
Uttarakhand	23
West Bengal	26
Grand Total	**1711**

Figure: Geography-wise break of PPP projects



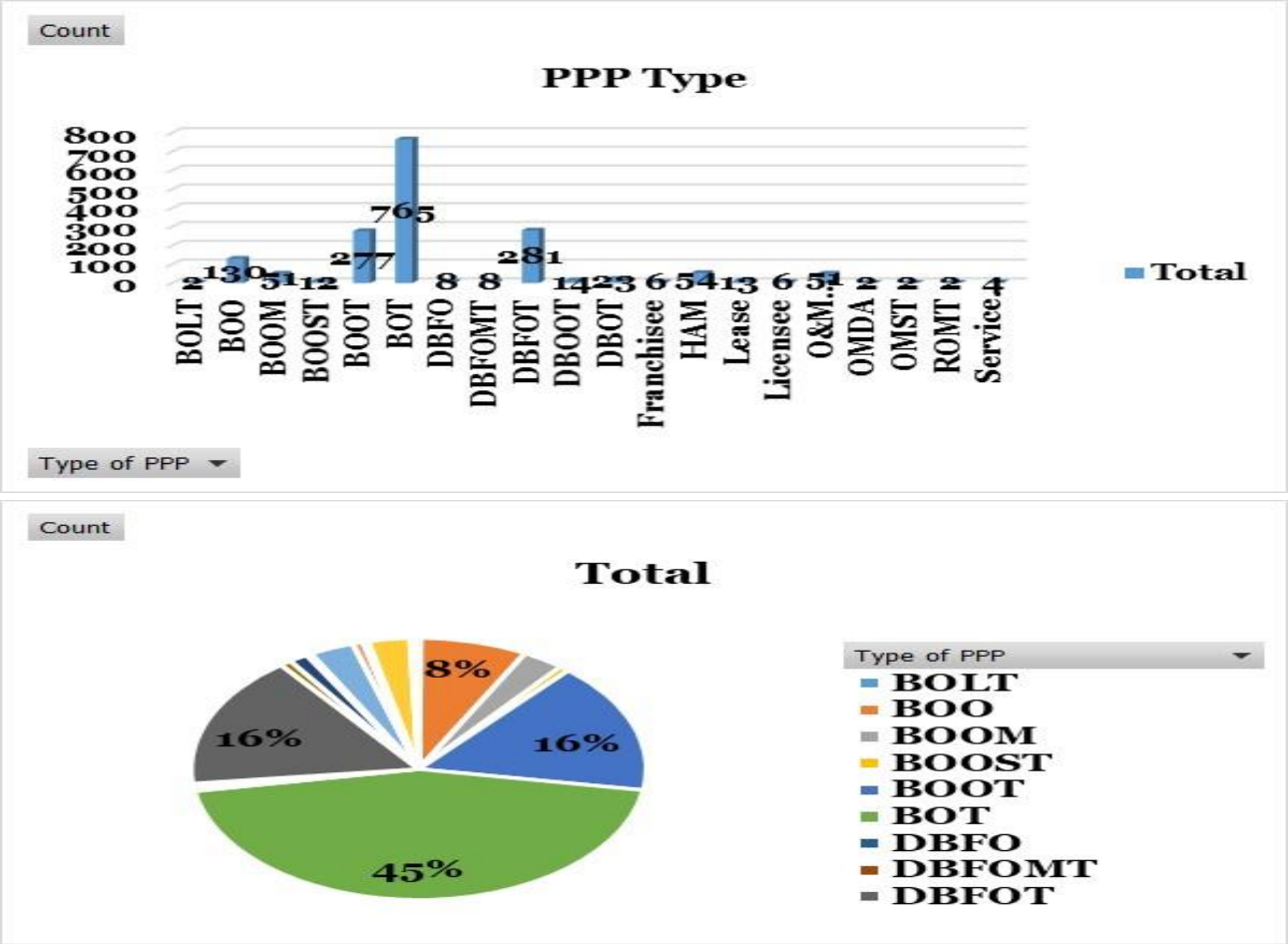
Source: Dept. of Economic Affairs (GoI)

Table: PPP-type wise distribution of projects

Project Type	Count
BOLT	2
BOO	130
BOOM	51
BOOST	12
BOOT	277
BOT	765
DBFO	8
DBFOMT	8
DBFOT	281
DBOOT	14
DBOT	23
Franchisee	6
HAM	54
Lease	13
Licensee	6
O&M Contract	51
OMDA	2
OMST	2
ROMT	2
Service Contract	4
Grand Total	**1711**

The PPP-type wise breakup suggests that most frequently employed PPP routes are BOT (~45%), DBFOT (~16%), BOOT (~16%), and BOO (7.60%).

Figure: PPP-type wise break of PPP projects



Source: Dept. of Economic Affairs (GoI)

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