

COST AND BENEFIT FLOW STREAMS OF THE SAMPLE GRAM PANCHAYATS

A. Introduction

1. The Government of India has requested financing from the Asian Development Bank for the proposed West Bengal Drinking Water Supply Improvement Project to ensure drinking water security in selected areas of the state of West Bengal affected by arsenic, fluoride, and salinity. The project aims to provide safe, sustainable, and inclusive drinking water to about 1.65 million people in Bankura, North 24 Parganas¹ and Purba Medinipur districts of West Bengal with the following outputs: (i) climate resilient drinking water infrastructure constructed, and (ii) institutions and capacity of stakeholders for drinking water service delivery strengthened. Public Health Engineering Department under the Government of West Bengal will be the executing and implementing agency for the project. Of the 66 *gram panchayats* covered under the project, three samples *gram panchayats* - Chaltaberia, Kashbalanda, and Sonapukur-Sankarpur - were selected to serve as samples for the economic analysis.²

2. As the proposed project is based on sector loan modality, a cost-benefit streams of the sample *gram panchayats* were carried out and shown in Tables 1-3.

Table 1: Cost Benefit Flow Stream for Sonapukur–Sankarpur
(\$ million)

Year	Cost			Benefits					
	Construction	O&M	Total	Non-incremental			Incremental	Total	Net Benefits
				Savings in resource costs	Savings in collection time	Savings in earning loss			
2018	0.23	-	0.23	-	-	-	-	-	(0.23)
2019	0.56	-	0.56	-	-	-	-	-	(0.56)
2020	0.68	-	0.68	-	-	-	-	-	(0.68)
2021	0.86	0.03	0.89	0.01	0.07	0.09	0.04	0.21	(0.67)
2022	-	0.05	0.05	0.01	0.15	0.19	0.09	0.43	0.38
2023	-	0.05	0.05	0.01	0.15	0.19	0.09	0.43	0.38
2024	-	0.08	0.08	0.01	0.15	0.19	0.09	0.44	0.35
2025	-	0.12	0.12	0.01	0.15	0.19	0.09	0.44	0.33
2026	-	0.12	0.12	0.01	0.16	0.19	0.09	0.45	0.33
2027	-	0.12	0.12	0.01	0.16	0.20	0.09	0.45	0.33
2028	-	0.12	0.12	0.01	0.16	0.20	0.09	0.46	0.34
2029	-	0.12	0.12	0.01	0.16	0.20	0.10	0.46	0.34
2030	-	0.12	0.12	0.01	0.16	0.20	0.10	0.47	0.35
2031	-	0.12	0.12	0.01	0.16	0.21	0.10	0.47	0.35
2032	-	0.12	0.12	0.01	0.17	0.21	0.10	0.48	0.35
2033	-	0.13	0.13	0.01	0.17	0.21	0.10	0.48	0.36

¹ One neighboring block in South 24 Parganas district, Bhangur II, was included in North 24 Parganas' drinking water scheme based on need and economy of scale.

² *Gram panchayats* are governing bodies at the village level.

Year	Cost			Benefits					
	Construction	O&M	Total	Non-incremental			Incremental	Total	Net Benefits
				Savings in resource costs	Savings in collection time	Savings in earning loss			
2034	-	0.13	0.13	0.01	0.17	0.21	0.10	0.49	0.36
2035	-	0.13	0.13	0.01	0.17	0.22	0.10	0.49	0.37
2036	-	0.13	0.13	0.01	0.17	0.22	0.10	0.50	0.37
2037	-	0.13	0.13	0.01	0.18	0.22	0.10	0.51	0.37
2038	-	0.13	0.13	0.01	0.18	0.22	0.11	0.51	0.38
2039	-	0.13	0.13	0.01	0.18	0.23	0.11	0.52	0.38
2040	-	0.14	0.14	0.01	0.18	0.23	0.11	0.52	0.39
2041	-	0.07	0.07	0.01	0.09	0.12	0.05	0.27	0.20
Total	2.33	2.29	4.62	0.10	3.30	4.13	1.95	9.49	4.87
ENPV	1.67	0.64	2.31	0.03	0.99	1.24	0.59	2.85	0.54
EIRR									13.0%

Note: EIRR = economic internal rate of return, ENPV = economic net present value, O&M = operation and maintenance.
Source: Asian Development Bank estimate.

Table 2: Cost Benefit Flow Stream for Kashbalanda
(\$ million)

Year	Cost			Benefits					
	Construction	O&M	Total	Non-incremental			Incremental	Total	Net Benefits
				Savings in resource costs	Savings in collection time	Savings in earning loss			
2018	0.25	-	0.25	-	-	-	-	-	(0.25)
2019	0.59	-	0.59	-	-	-	-	-	(0.59)
2020	0.72	-	0.72	-	-	-	-	-	(0.72)
2021	0.91	0.03	0.94	0.00	0.08	0.10	0.05	0.23	(0.71)
2022	-	0.05	0.05	0.00	0.16	0.20	0.09	0.45	0.40
2023	-	0.05	0.05	0.00	0.16	0.20	0.09	0.46	0.40
2024	-	0.09	0.09	0.00	0.16	0.20	0.10	0.46	0.37
2025	-	0.12	0.12	0.00	0.16	0.20	0.10	0.47	0.35
2026	-	0.12	0.12	0.00	0.16	0.21	0.10	0.47	0.35
2027	-	0.13	0.13	0.01	0.17	0.21	0.10	0.48	0.35
2028	-	0.13	0.13	0.01	0.17	0.21	0.10	0.48	0.36
2029	-	0.13	0.13	0.01	0.17	0.21	0.10	0.49	0.36
2030	-	0.13	0.13	0.01	0.17	0.22	0.10	0.50	0.37
2031	-	0.13	0.13	0.01	0.17	0.22	0.10	0.50	0.37
2032	-	0.13	0.13	0.01	0.18	0.22	0.10	0.51	0.37
2033	-	0.13	0.13	0.01	0.18	0.22	0.11	0.51	0.38
2034	-	0.13	0.13	0.01	0.18	0.23	0.11	0.52	0.38

Year	Cost			Benefits					
	Construction	O&M	Total	Non-incremental			Incremental	Total	Net Benefits
				Savings in resource costs	Savings in collection time	Savings in earning loss			
2035	-	0.14	0.14	0.01	0.18	0.23	0.11	0.52	0.39
2036	-	0.14	0.14	0.01	0.18	0.23	0.11	0.53	0.39
2037	-	0.14	0.14	0.01	0.19	0.23	0.11	0.54	0.40
2038	-	0.14	0.14	0.01	0.19	0.24	0.11	0.54	0.40
2039	-	0.14	0.14	0.01	0.19	0.24	0.11	0.55	0.41
2040	-	0.14	0.14	0.01	0.19	0.24	0.11	0.55	0.41
2041	-	0.07	0.07	0.01	0.10	0.12	0.06	0.28	0.21
Total	2.47	2.43	4.90	0.11	3.50	4.38	2.07	10.06	5.16
ENPV	1.77	0.68	2.44	0.03	1.05	1.32	0.62	3.02	0.63
EIRR									13.0%

Note: EIRR = economic internal rate of return, ENPV = economic net present value, O&M = operation and maintenance.
Source: Asian Development Bank estimates.

Table 3: Cost Benefit Flow Stream for Chaltaberia
(\$ million)

Year	Cost			Benefits					
	Construction	O&M	Total	Non-incremental			Incremental	Total	Net Benefits
				Savings in resource costs	Savings in collection time	Savings in earning loss			
2018	0.33	-	0.33	-	-	-	-	-	(0.33)
2019	0.79	-	0.79	-	-	-	-	-	(0.79)
2020	0.95	-	0.95	-	-	-	-	-	(0.95)
2021	1.21	0.03	1.24	0.01	0.11	0.14	0.06	0.32	(0.92)
2022	-	0.05	0.05	0.01	0.22	0.28	0.13	0.64	0.58
2023	-	0.05	0.05	0.01	0.22	0.28	0.13	0.64	0.59
2024	-	0.11	0.11	0.01	0.23	0.28	0.13	0.65	0.54
2025	-	0.16	0.16	0.01	0.23	0.29	0.14	0.66	0.49
2026	-	0.17	0.17	0.01	0.23	0.29	0.14	0.67	0.50
2027	-	0.17	0.17	0.01	0.23	0.29	0.14	0.67	0.51
2028	-	0.17	0.17	0.01	0.24	0.30	0.14	0.68	0.51
2029	-	0.17	0.17	0.01	0.24	0.30	0.14	0.69	0.52
2030	-	0.17	0.17	0.01	0.24	0.30	0.14	0.70	0.52
2031	-	0.17	0.17	0.01	0.24	0.31	0.14	0.70	0.53
2032	-	0.18	0.18	0.01	0.25	0.31	0.15	0.71	0.54
2033	-	0.18	0.18	0.01	0.25	0.31	0.15	0.72	0.54
2034	-	0.18	0.18	0.01	0.25	0.32	0.15	0.73	0.55
2035	-	0.18	0.18	0.01	0.26	0.32	0.15	0.74	0.56

Year	Cost			Benefits					
	Construction	O&M	Total	Non-incremental			Incremental	Total	Net Benefits
				Savings in resource costs	Savings in collection time	Savings in earning loss			
2036	-	0.18	0.18	0.01	0.26	0.32	0.15	0.74	0.56
2037	-	0.18	0.18	0.01	0.26	0.33	0.15	0.75	0.57
2038	-	0.19	0.19	0.01	0.26	0.33	0.16	0.76	0.57
2039	-	0.19	0.19	0.01	0.27	0.34	0.16	0.77	0.58
2040	-	0.19	0.19	0.01	0.27	0.34	0.16	0.78	0.59
2041	-	0.10	0.10	0.01	0.14	0.17	0.08	0.40	0.30
Total	3.27	3.17	6.44	0.16	4.91	6.14	2.90	14.11	7.67
ENPV	2.34	0.87	3.21	0.05	1.47	1.85	0.87	4.24	1.12
EIRR									14.23%

Note: EIRR = economic internal rate of return, ENPV = economic net present value, O&M = operation and maintenance.
Source: Asian Development Bank estimates.