

Summary of General recommendations: Budget implications

Issue	Capex (R mill)	Opex (R mill)
Institutional Issues		
Reassign functions & budgeting to be carried out on catchment management basis	20.0	
Appoint four new catchment planners		3.0
Include in communications strategy raising of awareness & empowerment of people to report on pollution	1.0	0.5
Make reporting easy - SMS, e-mail, etc.	0.1	
Re-establish some historic monitoring points in Kuils River in Blue Downs/Khayelitsha area		0.1
Establish 3 new monitoring points in Khayelitsha		0.1
Include additional indicator organisms for sensitive or problematic areas		0.1
Establish proactive inspection programme of agriculture, industry, businesses, residential areas & informal settlements		8.0
Appoint dedicated team of expert inspectors or external service provider to supplement City staff and establish inspection programme for inspection of municipal infrastructure most likely to cause water pollution		6.0
Technical Issues		
Establish programme for eradication of cross-connections, including documentation on GIS	10.0	5.0
Document temporary but necessary diversions of wastewater via stormwater system to sewer for management & eventual eradication	1.0	
Map all sewage spillages longer than 1 hour on GIS to prioritise further those areas requiring intervention & investment. Differentiate between spillage due to blockage or due to surcharge from ingress		1.0
CCTV identified sewers for infrastructure repair to prevent blockages (e.g. joint failure, cracking, etc.) & stormwater ingress		30.0
CCTV selected stormwater pipes to eliminate cross-connections		20.0
Implement focused communications & education strategy as part of strategy to reduce ingress of stormwater	1.0	
Implement recommendations for pre-construction and post-construction stages of strategy as set out in <i>Advice on the Elimination of Ingress of Stormwater and Infiltration of Groundwater into the Sewer System</i>	0.5	1.0
Engage with SABS on revisions to NBR pertaining to disposal of stormwater	0.5	
Ensure Master Plan for upgrading of informal settlements becomes part of catchment management plans (R&S)	1.0	1.0
Adequately resource CSRSM branch to manage solid waste in rivers, waterways and catchpits & increase street sweeping budget	20.0	70.0
Provide solid waste services to backyarders (tentative estimate)	200.0	60.0
Give top management attention to inter-departmental support to reduce incidents of dumping, esp. of builders' rubble. Include transformation of waste product into valuable resource such as road-building product	1.0	
Encourage experimentation & novel approaches, especially for the management of solid waste		5.0
Planning and Policy		
Retrofit & upgrade existing problem areas	20.0	
Runoff management		0.5
Embark on active campaign with agricultural unions & representatives of agriculture regarding importance of good water quality		1.0
Establish GIS-based database for thorough record-keeping, establishment of trends & pollution flows from agriculture		1.0
Communication and Liaison		
Appoint senior technical person to engage with key roleplayers in external environment		1.0
Appoint communications specialist to manage various communications & education strategies		1.0
Implement recommendations on signage	0.5	0.1
Implement targeted communications for each of media, City management, councillors, general staff, industry & associations, residents		1.0
Provide scope for feedback to citizens to reinforce positive behaviour		1.0
	276.6	217.4

Summary of additional recommendations per catchment: Budget implications

Priority: (High to Low)	Catchment	Diep River: Priority 1	Salt River: Priority 2	Zeekoe: Priority 3	Eerste/Kullis: Priority 4	Noordhoek: Priority 5	Sir Lowry's Pass: Priority 6	Sout River: Priority 7	Hout Bay: Priority 8	Sand River: Priority 9	South Peninsula: Priority 10	Lourens: Priority 11	Silvermine: Priority 12	Mitchell's Plain/Khayellisha	Selected Minor Catchments	TOTALS	
1A	Human	Capex															0.00
		Opex	1.25	1.25	1.25	1.25		1.25									
1B	Upgrade informal settlements	Capex	7.50	11.50	20.00	10.00	1.00	8.00	2.00	1.00	2.60	0.50	0.50		20.00		84.60
		Opex	1.30	1.30	3.00	1.00	0.20	0.80	0.30	0.20	0.20	0.10	0.20		3.00		11.60
2	Upgrade WWTW	Capex	36.00	32.00	36.40	74.40	3.30	8.00	0.70	0.70	1.70	0.30	3.00		7.50		204.00
		Opex	4.60	10.20	5.70	11.80	1.40	0.90	0.10	0.10	0.20	0.10	0.30		0.80		36.20
3	Ingress/ cross- connections	Capex	1.50	23.00	2.00	23.10		2.00			9.50	2.00	1.10				64.20
		Opex		0.10		0.10					0.10						0.30
4	Solid waste	Capex															0.00
		Opex															0.00
5	Sewage p/stations	Capex				0.50											0.50
		Opex						0.10	0.20								0.30
6	Rehabilitation, agriculture, animals	Capex		18.50	14.50						6.60	1.50					41.10
		Opex		2.40	1.10		0.10				0.50	0.20					4.30
7	Industry, construction	Capex	0.50	0.60	0.50		0.50					1.00	0.10				3.20
		Opex									0.10	0.10					0.20
8	Golf courses	Capex		0.10													0.10
		Opex			0.10												0.10
9	Rehab. of rivers	Capex															0.00
		Opex															0.00
10	Removal of alien veg.	Capex	1.00														1.00
		Opex	0.50														0.50
TOTALS per catchment		Capex (R mill)	46.50	85.70	73.40	108.00	4.80	18.00	2.70	1.70	20.40	5.30	4.70	0.00	27.50	0.00	398.70
		Opex (R mill)	7.65	15.25	11.15	14.15	1.70	3.05	0.40	0.50	1.10	0.50	0.50	0.00	3.80	0.00	59.75

The Business Case: Does good water quality make economic sense?

The value of good water quality in the stormwater system and the benefits it brings certainly justifies the investment for the achievement of good water quality and engineering into the future. De Witt et al. (2009) showed in a report presented to and accepted by the City that a conservative estimate of the natural assets in the City is that these yield a flow of services valued at R4 billion per annum.

An alternative approach would be to compare the reduction in health costs and increases in tourism revenue due to good stormwater quality. It was found that (for the City) a 1% decrease in health costs would justify an additional expenditure of over R110 million per annum and that a 1% increase in tourism income would justify a further additional expenditure of R230 million per annum.

Inspiration from around the world

The Cheong Gye Cheon Restoration Project is a revolutionary and inspirational project demonstrating what is possible in terms of the rehabilitation and restoration of urban rivers and learning from the past to shape the future. The project was undertaken by the Seoul Metropolitan Government in 2002 at a cost of over \$355 million.

The Cheong Gye Cheon River flows through the heart of Seoul and is around 13km in length. During the Japanese colonial period, with an increase in the urban poor population and the associated lack of sanitation facilities along the river, the stream became more polluted, earning notoriety as a breeding ground for infectious diseases and crime. At the

time it was considered prudent to cover the river. The construction of the Cheong Gye Elevated Highway started in 1967 and was completed in 1976.

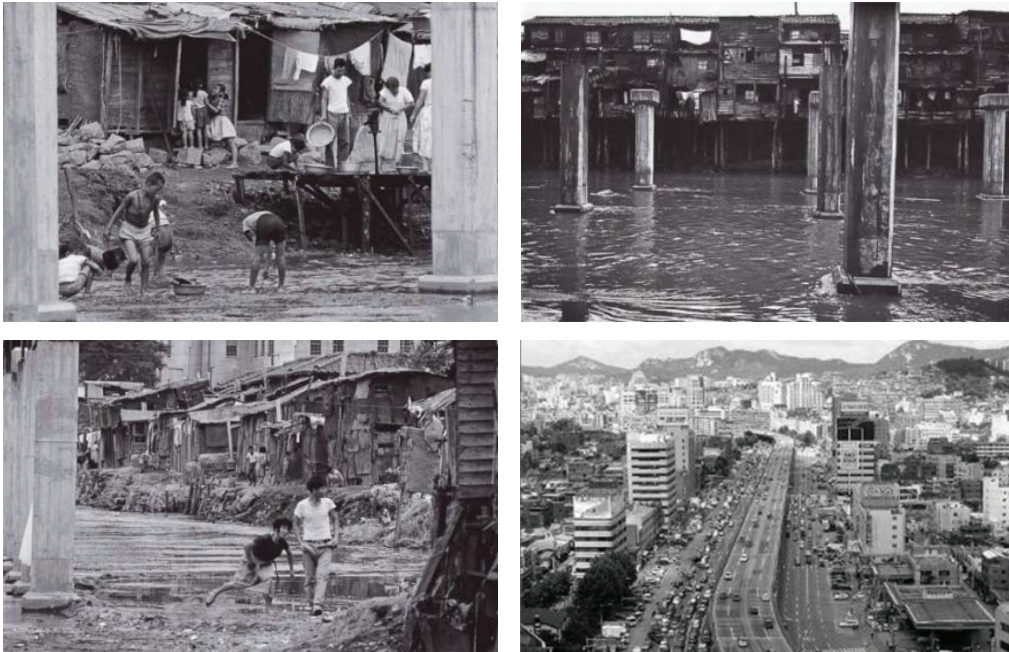
But with the highway came environmental consequences: a rise in air pollution and deteriorating health conditions of its citizens. In subsequent decades the neighbourhood surrounding the highway started declining rapidly, becoming a slum and losing any appeal as a residential or commercial area. This, coupled with a global shift towards environmental protection and respect for ecology, prompted the Cheong Gye Cheon Restoration Project in July 2002.

The restoration of the river as a human-orientated, environmentally friendly urban space to decrease health risks and stimulate the local economy, all under a framework of water quality improvement, has created a public works project that has drawn international acclaim.

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Yesterday...



Today and Tomorrow....



Figure 2 Cheong Gye Cheon Restoration Project, Seoul, South Korea **Urban River Renewal – A New Tomorrow!**

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