

Constructed wetlands need attention or else they fail

Constructed wetlands are designed for different purposes. They are not natural systems, and most often they don't work as well as their makers would like. The problem is that these creations become biological systems that don't operate according to human demands - nature doesn't run at the pace of a human clock. For example, in Cape Town plants don't grow during the cooler winter months, and the ability to absorb and treat dirty water is limited. This doesn't mean that we shouldn't try to build wetlands, to learn from our mistakes and also treat these kinds of systems as a way of contributing to public education. However, constructed wetlands need to be managed or else they will fail, and often badly.

When the wetland on the western bank of the Liesbeek River in Mowbray, opposite Rhodes Office Park, was built in 1997, the intention was to provide an aesthetically pleasing public environment and perhaps a secondary thought was to intercept and treat urban stormwater runoff. This development was funded by Rhodes Office Park complex as a contribution to the environment. I understand that the developers agreed to maintain the wetland for the first two years, thereafter it would revert to a City's Parks and Recreation department.



Newly constructed wetland adjacent to the Liesbeek River. Photograph taken by Douglas Metcalfe in 1997 soon after the project was completed.

Sadly the difficulty in maintaining the wetland caught everyone on the backfoot. Initially the wetland looked wonderful. It was beautifully landscaped and planted out with indigenous plants. In 1997, one of the Friends of the Liesbeek wrote in their local newsletter at the time, *"The wetland is going ahead and while it looks good on paper, it is an experiment which may well be inappropriate for this section of the river. I hope that we will be able to comment more favourably on this issue in the years to come."* Problems began a year or two after it was completed. The inlet pipe became clogged resulting in poor through flow of water from the river through the wetland. The Friends of the Liesbeek tried on several occasions to keep the inlet free, but it became a losing battle. Without proper through flow and refreshment

from the Liesbeek River, the soils in wetland began accumulating excess nutrients from stormwater runoff. All the ingredients were in place to change a once pretty wetland into a maintenance problem and a public eyesore. Phragmites reeds took over the wetland, as they do in shallow wetland systems throughout the Western Cape – an indication that they were thriving on the nutrients and actually doing a great job in absorbing pollutants. The familiar sight of a bunch of common reeds is hardly an attractive environment. The public were more displeased when these overgrown areas become the refuge for the homeless along with the excessive litter and general grim that accompanies those living in these conditions. Social factors are integral to understanding constructed wetlands are used and abused, and require dedicated management. It is also important to acknowledge that this wetland did and continues to absorb stormwater contaminants from a section of a formal residential area of Mowbray. The wetland is working, but just as it is being loaded with visible litter largely from homeless people, it is being loaded by contaminated water that is largely unseen.



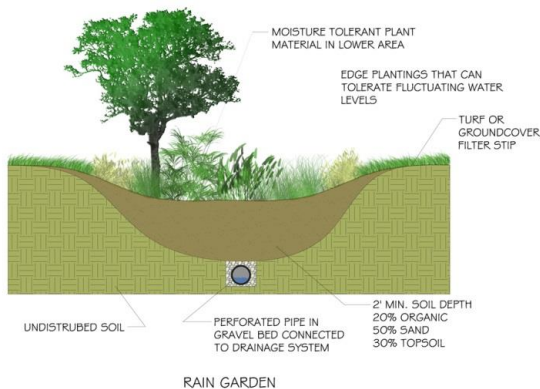
The wetland (20 October), first efforts to remove the reeds (again) exposing the litter

It is possible that the City and residents have reached a critical point. The question is being asked: what can be done now? It could be managed but in this case it is likely to fail because dedicated management is unlikely, too costly and probably not worthwhile in the bigger scheme of things. Perhaps an alternative design should be considered – one that is less maintenance intensive, looks good and continues to deal with the contaminated, runoff that often has elevated temperatures.

What should we be thinking about? Some questions for further discussion

- (a) How can we store and use the runoff as a water source?
- (b) How can we design a system that cleans the water?
- (c) How can we cool the water temperature down to similar temperatures as to that of Liesbeek River?
- (d) How will the design contribute to a sense of place? It is a well-used public walkway but the attraction is missing.

Some ideas – creating a rain garden; drawing water to the surface; runoff over shallow, cobbled channels



Dr Kevin Winter
UCT Urban Water Management Research Unit