The impact of community expectations and use on the operation of WSUD in Ku-ring-gai Council

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Overview

Since 2005 Ku-ring-gai Council has been implementing water sensitive urban design (WSUD) features to help reduce the impact of urban development on the surrounding natural environment.

This work has been largely funded through Council's Environmental Levy and is largely retrofit in nature. The works include 16 stormwater/rainwater harvesting systems and 15 filter systems (raingardens, swales & exfiltration pipes), many of which have different maintenance and operational costs to what was originally identified in the planning process.

A number of ovals that were not historically irrigated have had stormwater harvesting and reuse systems installed to provide irrigation on the oval to improve stormwater quality, reduce stormwater flows from urban catchments and provide partial irrigation (designed to meet a minimum of 75% of demand) to improve the existing quality of the oval. However, many sites have been altered to include the addition of potable water top-up to provide reliable irrigation in order to meet increased community expectations for the facility. This has had the impact of significantly increasing Councils potable water usage at these sites, which is not in line with the original intention of the works.

Council has also had to adapt the layout and functionality of some of our biofilters due to community engagement with the asset. This has included working with the community to integrate a defined bicycle track through an existing biofilter to minimise damage to the plants and maintain the treatment effectiveness.

This paper will explore a number of Ku-ring-gai's case studies and identify a number of changes to considerations and assumptions made in the planning of future projects.

Objectives

This paper will aim to identify:

- how community expectations have influenced operational management and maintenance of WSUD features and associated assets;
- the increase in potable water use directly as a result of implementing stormwater harvesting and reuse;
- changes to predicted operational and maintenance costs due to unforeseen community expectations and uses; and
- how existing stakeholder engagement can be improved and if more consultation is needed to educate the community on the purpose of the stormwater harvesting and reuse for irrigation of the oval. E.g. why the harvested water will not meet 100% of irrigation demand during dry periods.

Method

Existing stormwater harvesting and other WSUD features in Ku-ring-gai's LGA will provide case studies for discussion of the role of community impact on operational management and maintenance. This paper will review council's water use data and WSUD maintenance records and compare these to the limited expectations present when the systems were planned and constructed. This will help identify where operational management has altered the original purpose of the WSUD asset to meet new community expectations and enable Council to measure the impact of these changes. The level and type of community engagement will also be reviewed to help guide any required change.

Results

Implementation of WSUD features in Ku-ring-gai has, in some cases, led to increased potable water use and unintended recreational opportunities. The impact of these changes is not insignificant and needs to be considered as part of the planning phase for future projects and upgrades of existing systems.

In addition, council needs to identify an improved method of community, operational and maintenance engagement so that all stakeholders understand the purpose of the WSUD asset.

Conclusions

It is essential that organisations are flexible, particularly when working in a retrofit situation. When implementing WSUD features, it is important to be fully aware of all potential social and environmental impacts that may result. These impacts can range from children using a biofiltration as a play garden when it's dry to an unintended increase in potable water use at stormwater harvesting sites.

In looking for acceptance of sustainable water management and increased use of WSUD features, all of these issues need to be thoroughly understood in order to target community and organisational education to manage appropriate expectations.