Neighbourhood-Scale Greywater Recycling for Non-Potable Reuse in Mixed-Use Urban Areas

Many large urban areas of the world are suffering from inadequate water supplies and they have to manage water resources for more efficiently than they do now by lowering the overall urban water demand. One of the water demand management strategies is greywater recycling. Greywater is wastewater from baths, showers, hand basins, washing machines, dishwashers, and kitchens, but excluding toilets.

Greywater reuse has been explored as a more sustainable water resource management option to displace demand for fresh water, largely for residential use on a household or building level. However, the infrastructure needed and the disinfectant required for greywater systems make it difficult to see these systems as environmentally friendly and cost-effective, especially for individual households.

The aim of this project is to test whether a greywater sharing system at the neighbourhood scale is more sustainable than individual greywater systems in urban mixed-use areas. Figure 1 shows the model of sharing greywater between residential and office buildings. The urban neighbourhood in question may contain the following use types: residential, office, commercial, retail, hotel, student accommodation, restaurants, sport halls, and hospitals. To achieve this aim the 3 pillars of sustainability will be assessed:

1. Economic feasibility of system (installation, maintenance and operation)
2. Environmental impact (water saving and energy consumption)
3. Social acceptability

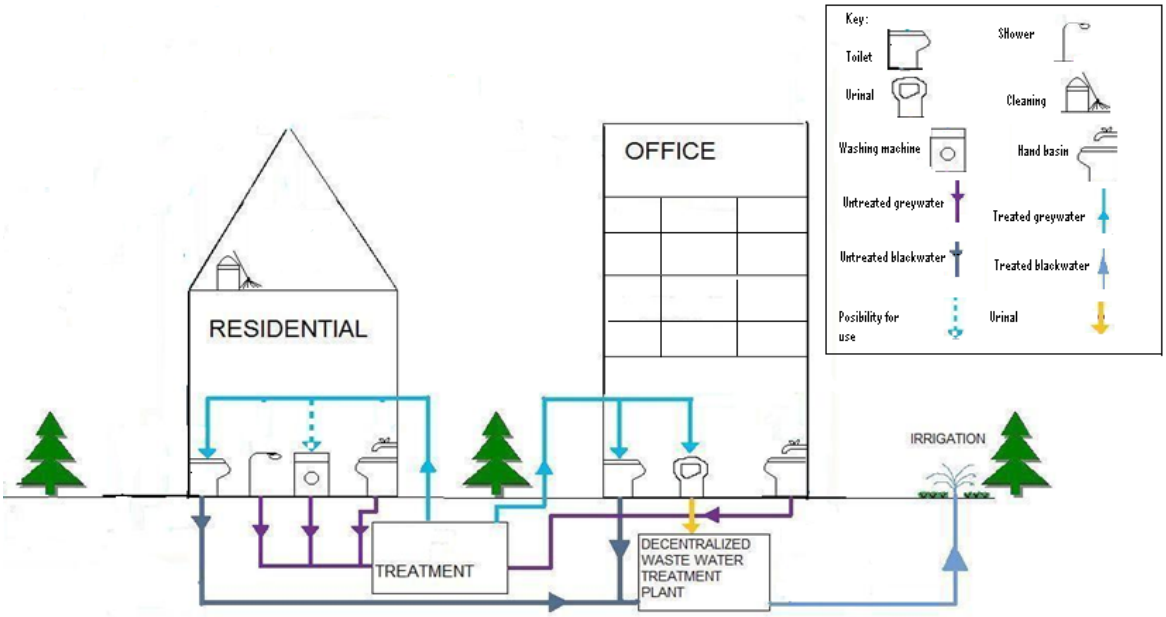

Figure 1: The model of sharing greywater between domestic and non-domestic buildings.

The intended outcome is a general framework for assessing the 3 pillars of sustainability of a neighbourhood-scale greywater recycling system in urban mixed used areas, applicable worldwide, to reduce the demand for potable. The results of this research will show the optimal scale for a greywater system between water users in urban mixed-use areas. Different treatment technologies will be analysed for the system to find the most appropriate one.

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