Greetings!

GREY WATER RECYCLING

Grey water is gently used wastewater that is discharged from bathroom sinks, showers, tubs, laundry and dish washers. This excludes black water (toilet water). Generally, 50-80% of all household water is grey water and may contain dirt, food particles, grease, hair and other household cleaning products. Freshly generated grey water is not as filthy or repulsive as black water, but if not handled properly it can become so. In fact, grey water is required to undergo treatment just as the black water before discharge to the environment.

This week’s eco-byte focuses on grey water recycling. It is important to note that before recycling grey water, ensure as a facility you take some minimum measures to reduce pollution as much as possible. For instance, consider the use of biodegradable chemicals for your showers and laundry purposes (i.e. laundry detergents, shower gels, shampoos, etc.). Also, ensure effluent from the kitchen flows through a grease trap to filter out the oils and grease before draining into the waste water management system.

The main purpose of grey water recycling is to substitute the precious but scarce fresh water in applications which do not require fresh or clean water quality such as irrigating lawns/gardens, car wash, flushing toilets, etc. therefore, grey water recycling offers facilities the chance to cut their water use by up to half. Aside from the obvious benefits of saving water (and money on your water bill), reusing your grey water keeps it out of the sewer or septic system, thereby reducing the chance that it will pollute local water bodies.

Sources of grey water

The main sources of grey water in accommodation facilities include;
• Bathroom grey water which can be contaminated with hair, soaps, shampoos, hair dyes, toothpaste, lint, nutrients, oils and cleaning products.
• Laundry grey water which varies in quality from wash water to rinse water.
• Kitchen wastewater is also a grey water source however, it is heavily polluted with food particles, cooking oils, grease, detergents and other cleaning products such as dishwashing powders. It is therefore important to treat kitchen grey water before it is re-used.

Why should you recycle grey water?
• Grey water recycling saves water and reduces the amounts of fresh, but scarce ground water by substituting the water demand not intended for drinking and other hygiene purposes i.e. less fresh water is sourced from rivers and other ground water sources.
• On-site grey water treatment reduces the volume of waste water that must be diverted to more costly sewage and septic treatments.
• Grey water recycling is a great way for you to reduce your carbon footprint and reduce your water bills.
• Grey water is a valuable resource for landscaping and plant growth especially in arid climates.
• Grey water is rich in phosphorous, potassium, and nitrogen, making it a good nutrient or fertilizer source for irrigation.

Grey water recycling methods
Grey water recycling can be achieved through the use of diversion systems and grey water treatment systems.

a) Diversion systems
Diversion systems do not store grey water but may filter and disinfect it before immediate reuse in a facility. These systems divert grey water into toilets for flushing, outdoor irrigation and to treatment wetlands. The systems involve some filtration to capture sediments and also involve disinfection whereby chlorine tablets are put in the toilet tank to kill bacteria.

The image below is an example of a toilet that re- uses grey water from a sink in a facility.
A toilet that re-uses grey water from a sink (Photo courtesy; Caroma profile smart model)

b) Treatment systems
Treatment systems include physical, chemical and biological grey water systems. These systems improve the quality of the greywater by filtering, treating and disinfecting it. Treated greywater can be stored for longer periods without the risk of it going septic and causing odour nuisances. Its higher quality and ability to be stored means that it can be used for more purposes, including garden watering and irrigation.

c) Physical and chemical grey water systems
In this system grey water is stored and treated with filtration and disinfection processes. Components of these systems include holding tanks, filters, and pumps. Many basic grey water treatment and storage systems also incorporate activated carbon and/or clay filters and disinfectants.

d) Biological grey water treatment
Biological grey water treatment uses biological water processing technologies and approaches. The treatment technologies include membrane filters to remove contaminants, bacteria, and viruses along with aerobic biological treatment. Aerobic biological treatment involves aeration to increase dissolved oxygen. This process activates bacteria that is present in the greywater to consume the oxygen and digest organic contaminants.
Grey water is however rarely re-used due to public health concerns and also, due to the public perception that it is unsafe or unhealthy and most people do not like the idea of re-using wastewater. A high level of caution must be exercised when handling grey water as it can pose a health risk especially if it is contaminated with pathogens.

When used for gardening, greywater should be applied to the subsurface to avoid any contact with ground water. Greywater should not be applied to fruits and vegetables that are eaten raw. For watering of fruit trees, greywater can be applied under mulch and when used to water the garden or for irrigation, no sprinklers should be used. Increasing grey water reuse can help provide more resilience to the insecurity of water supply as a result of climate change.

Please note, under Kenyan law- *Environmental Management and Coordination (Water Quality) Regulations, 2006*- every person who generates and discharges effluent into the environment should carry out quarterly effluent quality sample tests which should be tested in a NEMA (National Environment Management Authority) approved laboratory. The results obtained should be submitted to NEMA and issued with an annual Effluent Discharge License. The results obtained should assist the facility to comply with the standards set out in the regulations.
Eco-rating Certification Program

The Eco-rating Certification Scheme is a sustainable tourism certification program that aims to promote responsible tourism in Kenya. The program was launched in 2002 by Ecotourism Kenya in cooperation with tourism stakeholders in Kenya with a prime focus of recognizing best practices in business practices, conservation, community and cultural performance by tourism accommodation facilities. The accommodation facilities that apply and meet the criteria set are awarded Bronze, Silver or Gold certification based on their performance. Please see hyperlink ECO-RATING SCHEME

What’s latest on EK Eco-rating Certification?

In this month, the Eco-rating team will be in the Laikipia/Samburu and Amboseli regions while in August the team will head to Naivasha/Nakuru regions. If you would like to be featured in these set of audits, please contact the secretariat through ecorating@ecotourismkenya.org.