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Reuse Of Grey Water in Residential Building

Aman Sharma, Ar. Manita Saxena

ABSTRACT: India is facing a water crisis and by 2025 it is estimated that India's population will be suffering from severe water scarcity. Although India occupies only 3.29 million km2 geographical area which forms 2.4% of the worlds land area, it supports over 15% of world's population with only 4% of the world's water resources. With increased population growth and development, there is a need to critically look at alternative approaches to ensure water availability. These alternative resources include rainwater and bulk of water used in household will emerge as grey water and contain some minerals, organic waste materials dissolved and suspended in it. When this is allowed to flow out this will join the sewage and bacteriologically contaminated, resulting in a sewage stream. It is possible to intercept this grey water, at the household level, treat it so that it can be recycled for garden washing and flushing purposes. Keywords: Greywater, sources, treatment, recycle and reuse.

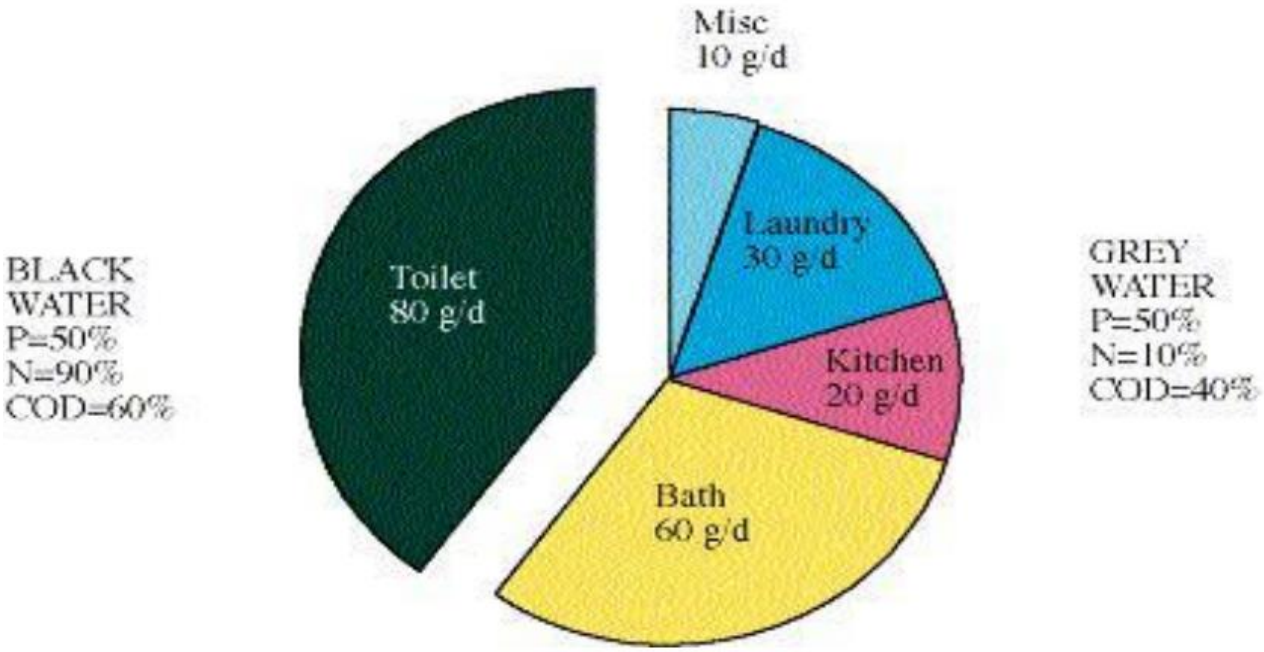
Introduction: The shortage of water resources is becoming a major concern for most of the countries in the world. The world population is increasing at an unprecedented rate, which has put a severe stress on the natural resources, especially water. Water is a basic human need, and it is essential to sustain life on earth. However, in many regions, the water supply is limited, and the quality of water is degrading day by day. Therefore, it is becoming increasingly important to find ways to conserve water and reduce wastage. One possible solution is the reuse of greywater, which is the wastewater generated from sources such as bathrooms, laundry, and kitchens.

COMPOSITION OF GREYWATER: Greywater from Bathroom Water used in hand washing and bathing generates around 50-60% of total greywater and is considered to be the least contaminated type of greywater. Common chemical contaminants include soap, shampoo, hair dye, toothpaste and cleaning products. It also has some faecal contamination (and the associated bacteria and viruses) through body washing. Greywater from Cloth Washing Water used in cloth washing generates around 25-35% of total greywater. Wastewater from the cloth washing varies in quality from wash water to rinse water to second rinse water. Greywater

generated due to cloth washing can have faecal contamination with the associated pathogens and parasites such as bacteria. Greywater from Kitchen greywater contributes about 10% of the total greywater volume. It is contaminated with food particles, oils, fats and other wastes. It readily promotes and supports the growth of micro-organisms. Kitchen greywater also contains chemical pollutants such as detergents and cleaning agents which are alkaline in nature and contain various chemicals. Therefore kitchen wastewater may not be well suited for reuse in all types of greywater systems.

HOW MUCH GREYWATER DO YOU PRODUCE?

According to state and local authorities we each use about 140 litres of water per day for cleaning and washing - greywater. The table below lists the expected volume in litres from each greywater source.



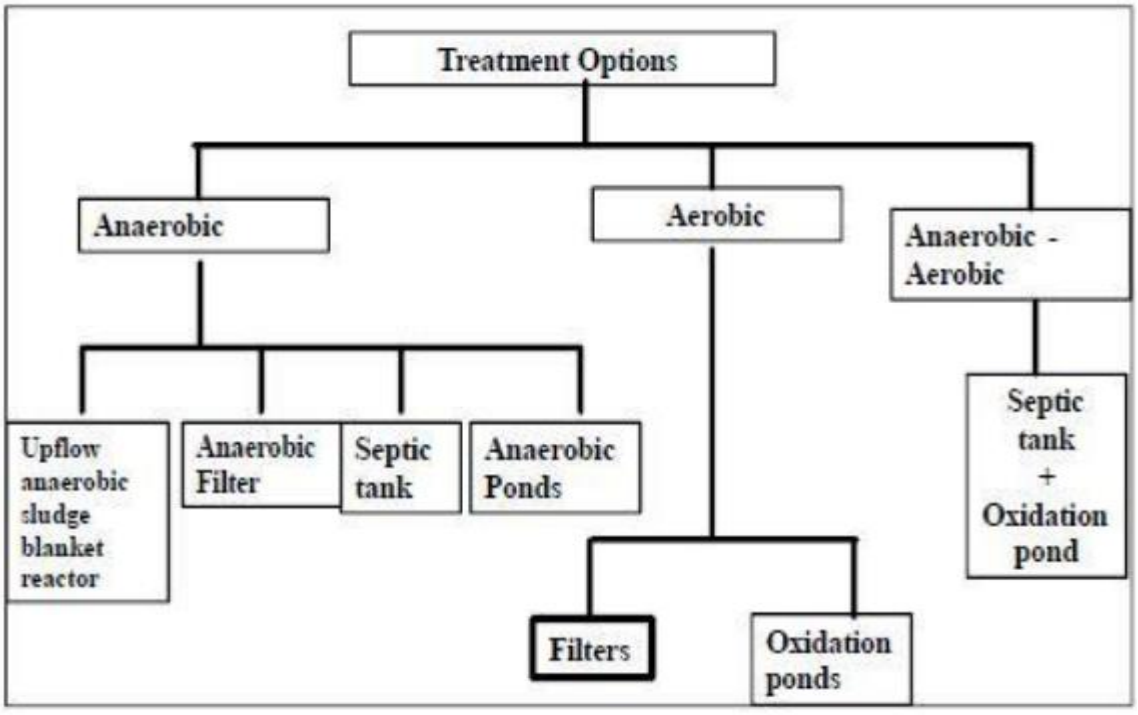
Combined Wastewater

Sources of waste water and its type

No.	Source of waste water	Types of waste water	Quantity/ day/person
1.	Toilets	Black water	3 liters
2.	Bathing	Greywater	20-30 liters
3.	Kitchen	Greywater	5-10 liters
4.	Washing cloth	Greywater	15-20 liters
5.	Animals	Greywater	10-15 liters

GREYWATER TREATMENT OPTIONS

Greywater reuse methods can range from low cost methods such as the manual bucketing of greywater from the outlet of bathroom, to primary treatment methods that coarsely screen oils, greases and solids from the greywater before irrigation via small trench systems, to more expensive secondary treatment systems that treat and disinfect the greywater to a high standard before using for irrigation. The choice of system will depend on a number of factors including whether a new system is being installed or a disused wastewater system is being converted because the household has been connected to sewer.



Reuse of grey water in residential buildings:

Greywater can be treated and reused for non-potable purposes such as watering plants, flushing toilets and other household activities. The reuse of greywater can reduce the burden on the potable water supply and minimize the discharge of wastewater into the environment. The reuse of greywater is an effective way to promote water sustainability and reduce the overall water consumption of residential buildings.

Benefits of reuse of grey water:

The reuse of greywater has many benefits for the environment and society. Firstly, it reduces the demand for potable water, thereby decreasing the burden on the natural resources; secondly, it reduces the discharge of wastewater into the environment, which helps to conserve the aquatic life and ecosystems; thirdly, it reduces the cost of water treatment and supply, which leads to economic savings for both the government and the consumers.

Challenges of reuse of grey water:

Despite the benefits, there are several challenges associated with the reuse of greywater in residential buildings. Firstly, the reuse of greywater requires a separate plumbing system and storage tanks, which can be expensive to install and maintain. Secondly, there are health and safety concerns associated with the reuse of greywater, particularly if the water is not treated properly. Lastly, there are regulatory and legal issues that need to be considered when implementing greywater reuse systems.

Conclusion:

The reuse of greywater is a promising solution to address the water scarcity issues and promote water sustainability in residential buildings. Although there are some challenges associated with implementing greywater reuse systems, it is essential to consider this option as a part of water conservation strategies. Governments and stakeholders should invest in research and development to improve the technology and promote the adoption of greywater reuse systems. Overall, the reuse of greywater can contribute to a more sustainable and water-efficient future.

research is needed to develop cost-effective and reliable greywater treatment systems that can ensure the health and safety of users. It is also necessary to educate and train homeowners and building managers on the benefits and proper maintenance of greywater reuse systems.

In addition, policymakers and regulators should develop standards and guidelines for greywater reuse in residential buildings, including minimum treatment requirements and appropriate uses for the reused water. Building codes and regulations should be updated to facilitate the installation and operation of greywater reuse systems, and incentives should be provided to encourage their adoption.

The benefits of greywater reuse extend beyond the individual household level. Communities and regions can also benefit from large-scale greywater reuse projects. For example, treated greywater can be reused for irrigation of public parks and green spaces, reducing the demand for potable water and promoting water conservation on a larger scale.

Overall, the reuse of greywater in residential buildings is a practical and effective way to conserve water resources, reduce the burden on the potable water supply, and protect the environment. With proper implementation and management, greywater reuse systems can provide significant benefits to homeowners, communities, and the planet as a whole.