

# ANALYSIS OF WATER CONSUMPTION AND REUSE IN THREE STAR HOTEL: A REVIEW

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## Introduction-

The reuse of waste water represents common part of building water cycle in most countries. We can say that for India is using of recycled water entirely new concept. For end users are in particular the best known terms like using rainwater, or in case of sufficient groundwater sources using water from the well. But it is important point to the fact, that there exist another alternative source of water supply, which is daily available during our routine using of water in buildings.

The main topic of this article is to describe, how we can treat with this source of water, and demonstrate its potential utilization, which means saving particular source of potable water and in parallel to water savings, bring financial savings.

Hotel facilities consume significant amount of water, essential resource for their services. Due to the increase of water demand in last decades, and to the current situation of water scarcity in many regions of the planet, water management should be improved. This work presents the study of three star hotel facilities located in the city of Lucknow and surroundings, whose water consumption have been registered for three months, and evaluated.

For each of them, fixtures and equipment used and current water management have been analyzed, identifying water saving opportunities, considering replacing existing fixtures and equipment, implementing correct standards of behavior and considering alternative water sources for non-potable applications. The work analyses the impact of these actions on consumption, and their economic profitability.

Water is a finite and vulnerable resource, nowadays considered an economic good. It is well known that a crisis of water resources is taking place all over the world as more than 2 billion people lack access to clean drinking water and a large share of world population will face severe water scarcity by next decades. Moreover, in last years, due to population and economic growth, changes in lifestyle and higher standards of living, global water use has tripled.

The purpose of the study is part of a broader concept: developing green management standards that hotel businesses should implement. In particular, the whole work arises from the need to optimize and improve water consumption within hospitality facilities, presenting key water measures that businesses should implement.

The moral reasons are equally compelling: water is a scarce resource in many resorts around the world so hotels have a responsibility not to use more than necessary; in rural or remote areas it ensures that local residents are not deprived of their essential supply; and by reducing the amount of waste-water that needs to be treated, this lessens the risk of water pollution.

**Key-Words:** - water demand, water production, saving potential, system design, grey water, white water

**Scope** - How to reuse waste water in hotel.

**Objective** – To study the water consumption in three star hotel for different purposes and how to reuse the waste water in three star hotels.

## **LITRATURE REVIEW-**

**MARTINA RYSULOVA, DANIELA KAPOSZTASOVA, GABRIEL MARKOVIC, FRANTISEK VRANAY 2006** What is grey water and how we can use it? There are lots of proven and operating grey water systems in the world. Slovakia is in this regard quiet lagging country, where system doesn't have this position, neither instance of application. Due to approach the topic of reuse systems, this article describes grey water system reuse and its brief characteristic. The main aim of this article is to characterize the grey water system, its design and water treatment on the case study by pointing out its saving potential. Therefore this study confirms, that system of alternative recycled water use, can save particular source of potable water, where the water is

unnecessarily wasted and used where drinking water quality is not needed. In parallel to water savings, grey water system can bring financial savings, which are relevant especially for users at decision-making processes. It is obvious that systems have advantages and disadvantages, but if we are sustainable thinking, we have to refer about every drop of water we can save, and we can consider that grey water system is the way we can reach it.

**Marta Dinarès David Saurí 2008** Water supply is a constraining factor in many mass tourist destinations, such as those of the Mediterranean region. Intensifying and increasingly frequent droughts in the context of climate change raise concerns about the sustainability of the tourist sector. Does the hotel sector respond to such concerns, and if yes, how? How do drought episodes affect the adoption of conservation practices and how may adaptive responses differ according to the characteristics of hotel establishments? We survey hotel managers in the Mediterranean city of Barcelona and analyze the annual water consumption of the hotels in the city over a period of 10 years, including four drought events. We find that droughts act as drivers of technological and behavioral change, with the effects being more pronounced in higher star hotels. Drought regulations issued by the government appear to send important signals to the hotel industry, and trigger the adoption of conservation measures. Hotel heterogeneity should be taken into account in future analysis and policy design.

**Amphai Wejwithan 2017** The relationship between growth of tourism industry and wastewater has been the big issue in many important tourism destinations in Thailand. Ao-Nang area is in Krabi province in the southern of Thailand, the one of those destinations that has been faced with the big volume of wastewater and also waste water discharge problem. The main concern is the beaches and coastal area. Smelling of the un-well treated or untreated wastewater is the negative impacts to the tourism area such as Ao-Nang. Hotel businesses in the area have been blamed as one of the most important source of the wastewater. The green leaf hotel who are willing to avoid the long term impacts from wastewater as a big issue in the tourism destinations and effects to the business both direct and indirect ways. In this paper, the example of this report is one of the top green operation hotels in country. This hotel is Pakasai Resort Krabi, one of the five leave hotel in the Green Leaf Certification System (GLCS) and one of the hotel who want to create zero discharge case of water, in Thailand. Approximately 70% of water consumption will be turned to wastewater in the hotel operation. In this hotel 75.42% of water consumption in building 1, 2 and 3 turned to wastewater. 55.71 of wastewater was overflow to the wastewater treatment in hotel.

**Nadim Charara March 2011** Barbados is water stressed, with water production close to its renewable freshwater resources. The hotel sector uses far more water than the general population (756 vs. 240 L/cap-d); water savings there would improve the overall water balance. No comprehensive analysis exists for water use by the Barbados hotel industry; this study addresses the gap. Data were collected from the Barbados Water Authority and from onsite surveys; consumption patterns were compared with international studies which had established environmentally acceptable benchmarks. The water use efficiency of Barbadian hotels was also studied as a function of "influential variables": unit water consumption was somewhat correlated with the number of rooms, average room rate, property size and number of employees. The lack of success in reducing hotels' water consumption is tied to the fact that water bills represent less than 5% of their annual expenses. A model for unit water consumption was derived using two influential variables: the annual number of guest nights and the number of employees.

**Conrad-J.Wuleka Kuuder, Ernest Bagson, Vida Mintah Prempeh, Abu Mumuni, Raymond Adongo, Esther Ekua Amoako 2013 feb** This study was aimed at identifying environmentally friendly practices adopted by accommodation facilities in Tamale Metropolis. From time immemorial environmental problems have been associated with the operations of accommodation facilities worldwide. In this regard, measures and initiatives have been put in place in recent times to minimize the effects of the accommodation sector on the environment. What is the effort of the accommodation sector in the Tamale Metropolis and Ghana holistically in this regard? A total of 42 facilities were sampled from 68 registered hotels in the Metropolis for the study. The data collection tool used was questionnaire. Parameters of concern centered on water conservation, energy conservation, waste management and corporate social responsibility. From the study, it was realized that only 8% had environmental policies in place. Close to 97% of the facilities did not live up to their corporate social responsibilities. However, about 60% used low flow shower heads while 97% used treated water to irrigate gardens and lawns. The use of energy saving bulbs as well as towel and napkin reuse was popular practices observed. Based on the above, training programmed are recommended for hotel operators and employees on environmental management practice.

**Fu E. Tang, 2012** In the effort to reduce water consumption for resorts, more water conservation practices need to be implemented. Hence water audits need to be performed to obtain a baseline of water consumption, before planning water conservation practices. In this study, a water audit framework specifically for resorts was created, and the audit was performed on two resorts: Resort A in Langkawi, Malaysia; and Resort B in Miri, Malaysia. From the audit, the total daily water consumption for Resorts A and B were estimated to be 180m<sup>3</sup> and 330 m<sup>3</sup> respectively, while the actual water consumption (based on water meter readings) were 175 m<sup>3</sup> and 325 m<sup>3</sup>. This suggests that the audit framework is reasonably accurate and may be used to account for most of the water consumption sources in a resort. The daily water consumption per guest is about 500 litres. The

water consumption of both resorts is poorly rated compared with established benchmarks. Water conservation measures were suggested for both resorts.

**S. Gautam, S. Ahmed, K. Ahmed and A. Haleem 2016** Fresh water demand and availability has direct impact on environment and society. Five star hotels are intensive water guzzlers of fresh water for their luxurious services. This paper presents a detailed study for the development of benchmark for fresh water consumption by using Delphi technique. A comprehensive questionnaire was developed to gather the opinion from a panel of 36 experts including stakeholders, academicians, policy makers and NGOs on the concerned issues. The collected responses were analyzed by an application of Delphi technique to develop a benchmark for fresh water consumption in five star hotels. After two iterations the resulted benchmark emerged as 400 litres/guest-night. This will help policy makers and other stockholders in developing sustainable practices in hospitality sector.

**Ahmad T., et al. (2012)** Based on the results of statistical analysis, which show the impact of Customer Relations Management on the level of client's satisfaction, confidence and the retaining of the clients of the State Hotel of India, it is clear that there is no company in the world dropped from defects and imperfect. Without doubt, every company should scrutinize and upgrade its plans despite of its success to identify the new strategies, which appropriate to the developed management surroundings, which specified the needs and desires of old, or new consumers.

**Chawdhury B. (2013)** Tourism can stimulate economic growth at local and national levels and promote the growth of agriculture, industry and service sectors. Tourism helps in the development of infrastructure through the construction of roads and tracks to different areas of tourist attraction. Tourism can generate financial resources for conservation of the natural environment. Tourism can stimulate the development of the transport infrastructure which can stimulate access to and from different places.

**Ghai A. and Rizwan S.A. (2013)** The high pressure and overloaded working will affect the health conditions of the employees of this division due to stress built up. Recognition at all levels not only place of work but in society is missing. Hostel should launch a programme where self esteem and overall image in the eye of internal environment and society in general should be improvised upon. Once these basic issues and barriers to motivation has been dealt for satisfaction of higher needs the studies have to be based on effects of media reporting, outside perception, and family and leisure involvement on employee's morale.

**Mathai R. (2014)** Indian hotel industry is a boom with international and Indian owned hotel with domestic and foreign tourists in the county. Knowledgeable and skilled employees are proved to be an asset in hospitality industry. In order to enhance their competitiveness and skills, training and development of employees are essential. E-learning can be used by the management for rapid delivery of information, more reliable and better learning opportunities for employees. Elearning has several advantages such as online testing of employees, user friendly design process, flexibility, self learning, and self practice and also software's can be updated.

**Ramachandran D. and Sundhararaman R. (2013)** It is responsible for promotion of India as a tourist destination, development of tourism Infrastructure and facilities in the country, and performing regulatory functions in the field of tourism. It has four regional offices at Delhi, Mumbai, Kolkata, and Chennai and a sub-regional office at Guhawati. The regional offices supervise the working of other tourist offices situated at different places throughout the country. Tourist offices are also located at various places abroad.

**Srivastava S. (2011)** The term 'Tourism contributors to economies' denotes all the service industries, which are essential for the domestic and the international tourists. It includes all the transport facilities like airlines, railways, travel buses, taxis, Accommodation sectors- all star hotels, resorts, small restaurants, local shops, different handicrafts exhibitions and other local made products.

**Thakur S.K. (2014)** This Industry needs star-performer. Nothing good is possible, when we continue with a pool of non-performer and nothing is impossible when we peak a team of star performer. Presently we find tourism industry of India is facing image problem. Increasing the number of star performers need top priority in this sector. The apex institutions in India have stepped to offer specialisation in Tourism Education courses.

**Thryambakam P. (2013)** Community based sustainable Rural tourism has been a valuable vehicle to bring the ultimate rural stakeholders in touch with tourism sector to increase employment. In order to make this more meaningful, it is very important that the sustenance issues be discussed with the community before the start of the project and also Aggressive marketing of the destinations be taken up with the local and international Tour Operators. Both short-term and long-term planning, implementing and monitoring are vital in avoiding damage to rural areas. Environmental management, local involvement, sound legislation, sustainable marketing, and realistic planning are crucial for development of community based sustainable rural tourism.

**Bhatia A. (2013)** The ministry of tourism can analyze the strengths and weaknesses of Indian tourism industry and also explore the favorable opportunities coming its way and minimize the effects of threats posed so that Indian tourism industry can be benefitted from it. As the world tourism organization highlights have also revealed in their study that there will be a shift in global

trend of foreign tourist arrival from advanced economies to emerging economies and India being a part of the latter should therefore be ready enough to grab the fruits of these opportunities coming its way.

**Gupta N. (2013)** In the society tourism profession is regarded only as job of travel agents and tour-guide, tourism profession is not valued in the society and people working in tourism industry were not getting respect.. So awareness should be drawn in the society about the contribution of tourism in national economy and its importance as a source of revenue generation. And tourism professional should feel pride to be a part of one of the largest industry of the country.

**Jain D. (2013)** Every destination country is trying to attract more tourists by drawing the attention and growing the interest among the potential tourists through adopting effective marketing strategies. Promotion is an important element of marketing mix and plays a vital role in developing marketing strategies. Because of tourism is a field where the tourists want to know in advance about the attractions and facilities of the destination. Marketers need to provide such necessary information to the prospective tourists through different promotional measures and thus, try to motivate and attract them to the sponsor's destination.

**Jaswal S. S. (2014)** Tourism helps preserve several places which are of historical importance by declaring them as heritage sites. For instance, the Taj Mahal, the Qutab Minar, Ajanta and Ellora temples, etc. would have been decayed and destroyed had it not been for the efforts taken by Tourism Department to preserve them. Likewise, tourism also helps in conserving the natural habitats of many endangered species

**Jeganathan G. S. and Srinivasulu Y. (2014)**, Hotels are stepping away from the traditional bottom line which mostly concentrate on profit making. Most of the entities are following triple bottom line approach of sustainable development which includes society and environmental contribution in addition to profit making. Women empowerment, children's education, digital infrastructure program and helping slum people are some of the milestones achieved by the hospitality firms in a recent past. Green hotel, eco-friendly equipment and renewable energy are success of sustainable development

**Kalaskar P. (2013)** In India the hotels are classified on the basis of general features and facilities offered, hence they are classified as five star deluxe, five star, four star, three star, two star, one star and heritage hotels. These are the classification given by Ministry of Tourism, Government of India. Every five years these ratings are put under review. The 5 star hotels are included in the premium and luxury segment, 3 and 4 star hotels are included in the mid market segment, 1 and 2 star hotels are included in the Budget hotels.

**Mishra L. and Juyal S. C. ( 2012 )** The major reason for people being attracted to Hill stations is the calm, cool and serene environments and scenic beauty they offer. The natural environment and the Biodiversity offered by hill stations is one of the basic ingredients of tourism and have historically been behind the development of Tourism and related activities. In India, quite notably Hill Tourism developed in Mughal and British Times, wherein the hill destinations served as resorts for the royals.

**Naik A. and Jangir S. (2013)** Tourism is a socio-cultural event for the traveler and the host, part of travels attraction is the opportunity to see different areas of the world and observe foreign cultures and way of life international travels brings the residents of urban industrial societies to less developed nations and culture. The contrast between resident and visitor under these circumstances is because of the difference in language, cultural values, economic development and politics. Such differences are also observed in domestic tourism and this brings people of different backgrounds and lifestyle together and can lead to conflict concerning land use and economic priorities in the destination areas.

**Naveed M. (2012)** Customer Relationship Management is a powerful management tool that can be used to exploit sales potential and maximize the value of the customer to the hospitality industry. In the long term, Customer Relationship Management produces continuous scrutiny of the hospitality business with the customer, thereby increasing the value of the customer's business. Hospitality sector's greatest assets are their knowledge of their customers. They can use this asset and turn it into key competitive advantage by retaining those customers who represent the highest lifetime value and profitability. They can develop customer relationships across a broad spectrum of touch points such their franchise branches.

**Pesonen J. (2012)** Segmentation can be regarded as one of the cornerstones of marketing. In online marketing importance of social media has been growing. In this study these two marketing aspects are combined by segmenting tourists according to social media channels they use. Social media users are segmented to nine segments using two-step cluster analysis. Also a segment of social media nonusers is found. These ten segments differ from each other in what social media services they use as well as their online information and buying behavior and some socio-demographic factors

**Phukan H., et al. (2012)** Spirituality, in general, has recently become an important subject of research in social and business areas. This has added a new dimension to the tourism industry, called spiritual tourism. Spiritual tourism, also termed as religious heritage tourism, includes all the religions, religious places associated with, emotional attachment to these centers and infrastructure facilities for the tourists. This can also be referred to as pilgrimage tourism, as clients are not looking for luxury but arduous journeys to meet the divine goal or simple life.

**Sharma A., et al. (2012)** FDI plays a significant role in expanding the tourism sector in India. This shows that appropriate policy to explore tourism resources and plans to develop new tourist venues and facilities may need to be considered in order to meet the increasing demand of tourism in India expected as a result of continued strong foreign direct investment. The Travel & Tourism industry provides tremendous opportunity to India in terms of contribution to its GDP and employment generation.

**Sharma A. and Kukreja S. (2013)** Hospitality Industry is sharing a large portion in total tourist receipt. But still we are lacking behind in gaining expected foreign exchange and international tourist traffic from this sector. The major constraint in the expansion of international tourist traffic to India is non-availability of adequate infrastructure including adequate air seat capacity, accessibility to tourist destinations, accommodation and trained manpower in sufficient number. Poor visitor experience, particularly, due to inadequate infrastructural facilities, poor hygienic conditions and incidents of touting and harassment of tourists in some places are factors that contribute to poor visitor experience.

**Singh M. K. and Arora N. (2014)** Sustainability of operations has been readily accepted by the players in the hospitality industry. They have adopted a holistic approach to sustainability placing it at the heart of their business strategy. All the industry segments are increasingly adopting these sustainability practices. A few of these practices include reducing their carbon footprint by investing in efficient technologies for waste management, water and power preservation, implementation of green designs and structural design for new projects etc.

**Mahadev**, in his article, has suggested various physical planning decisions modifying the spatial trend. He has attempted to study the location pattern of different temporal stages. The author has analyzed the spatial structure of hotel industry in the city of Mysore.

**Singh, T.V** in his study, has assessed hotels capacity at twelve different locations of tourist importance in the State of Uttar Pradesh. The main findings of the study were that the domestic tourists are neither choosy about accommodation nor they demand superior service. But the foreign tourists demand better quality hotels. As such, there is a shortage of accommodation in relation to foreign tourist.

**Anand, M.M.** in his study, makes an attempt to analyze the nature of this multidimensional tourist plan whose activities range from the provision of comfortable lodging to facilitating a visit to a national monument. He has examined the structure and working of the plan. He says that the hotels and other supplementary accommodation are the core of the plan. According to him, the first prerequisite for the development of hotel industry is the forecast of the future demand, which would mean information about the number and type of persons who would be making use of the facilities. It is in terms of demand that the right supply, at right place, right time and at right price is to be built up.

**Guha**, while highlighting the importance of the hotel industry in Indian tourism has suggested that the hotel has to provide basic hospitality services besides doing marketing (promotions) of rooms, supply of food, etc.

**Kachru, Arun**, in his paper, concludes that each hotel room given employment to 3 direct workers while indirectly 9 workers are employed. Further important role of hotel industry is the generation of employment and foreign exchange earnings.

**Nadkarni, M.M.** opines that due to neglect of buildings adequate infrastructure such as airports, road transport, communication, etc., are the main reasons for a setback to hotel industry. He points out that there still there is a shortage of rooms facilities in luxury and deluxe hotels. He concludes by saying that there should be a proper tourism planning.

**Negi, Jag Mohan** has tried to analyze different aspects of hotel industry, including hotel ownership, hotel franchise and investment in hotels. He raises a number of problems and difficulties, owing to inadequacies of statistical information. He has laid more emphasis upon construction of budget hotels for facilitating the flow of low and middle income groups of domestic tourists. He predicts that the future of hotel industry depends upon the proper planning by the Government for providing monetary and fiscal incentives so that it will attract many young hotel entrepreneurs to enter and invest in hotel business more and more in the future, ensuring a steady growth and development of the hotel industry in the country.

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**Singla** in his article, has traced the development of the hotel industry in India. The origin of accommodation in ancient times and their growth over the period starting from the accommodation provided by the Pandas at the pilgrimage centers to the Dharmashalas built by the kings and Serais that were introduced by the Muslim rulers.

**Swain, Sampat Kumar and Babu P George.** in their article, have measured the employees perceptions of some of the human resource development practices prevailing in the classified hotels in Orissa. In all, four perceptions of employees were measured and analyzed, namely, employees perception that there is a positive association between professional training and organizational effectiveness and employee promotion. The employees who have undergone professional training have more positive perception of the benefits of professional training than their counterparts and employees of 5-Star category hotels perceive that there is a positive association between professional training and promotion than the employees of low star hotels. The sample size was 90 and collected data were analyzed by using SPSS Package. The main findings of the study were that hotel employees do appreciate the fact that there is a positive association between professional training and their chance of promotion.

**Dr.Premkumar** in his article, emphasizes the use of common strategy to maximize revenue in hotel industry - a practice referred as revenue or yield management. Revenue management is a scientific technique that combines operational research, statistics and customer relationship management and categorizes customer into price bands based on various services. Statistical analysis of past data helps in forecasting demand and establish the appropriate price bands. Applied correctly revenue management helps hotels to expand market size and increase revenues. He emphasizes that: (i) proper market segmentation based on the price and willingness to pay; (ii) the hotel's capacity is fixed in terms of rooms; (iii) the rooms are the inventory; if not occupied for a night, these will lose their revenue, as such, it is a perishable inventory; (iv) once the hotel recovers its initial fixed costs, the cost of servicing the additional customer is low, so that the hotel can sell the room at a lower margin.

### Methodology

- Water saving
- Developing strategies for each area
- Controlling and reducing water consumption
- Maintaining proper functioning facilities
- Optimizing the use system
- Training the staff
- Raising awareness among customers

### COLLECTION OF WATER IN THE HOTEL

It is defined as the freshwater taken from ground or surface water sources, either permanently or temporarily, and conveyed to the place of use. If the water is returned to a surface water source, abstraction of the same water by the downstream user is counted again in compiling total abstractions.

There are two type of waste water are created in a hotel-

- 1)Black water
- 2)grey water

### REUSE OF GREY WATER

**Greywater** is gently used water from your bathroom sinks, showers, tubs, and washing machines. It is not water that has come into contact with feces, either from the toilet or from washing diapers.

Greywater may contain traces of dirt, food, grease, hair, and certain household cleaning products. While greywater may look "dirty," it is a safe and even beneficial source of irrigation water in a yard. Keep in mind that if greywater is released into rivers, lakes, or estuaries, its nutrients become pollutants, but to plants, they are valuable fertilizer. Aside from the obvious benefits of saving water (and money on your water bill), reusing your greywater keeps it out of the sewer or septic system, thereby reducing the chance that it will pollute local water bodies. Reusing greywater for irrigation reconnects urban residents and our backyard gardens to the natural water cycle.

## GREY WATER TREATMENT TECHNIQUES

Degree of treatment can be decided based on the treatment quality to be achieved. Reuse of domestic waste water for potable use requires a higher degree of treatment including the tertiary treatment. But water quality for various non potable uses like landscape irrigation, agriculture, toilet flushing and ground water recharge can be achieved more easily by using the conventional and cost effective treatment techniques like coagulation, filtration and biological treatment systems.

**1. Preliminary treatment-** Removal of a fraction of suspended particles as well as oil and grease will help the efficient functioning of the main treatment scheme. Fine screens (size < 6mm) can be used to remove the suspended particles like dust, hair and food particles escaping kitchen sink strainer.

**2. Physico Chemical treatment-** Grey water demands considerable removal of turbidity and SS which can be achieved by physicochemical techniques like filtration and coagulation. These are conventional and cost effective techniques used in community water supply schemes. As the organic loading in grey water is less, properly designed sand filtration unit or coagulation unit can attain required BOD removal standards also. But to achieve total coliform and residual chlorine standards, a chlorination unit is also required.

**3. Biological treatment-** biological treatment techniques like Membrane Bio Reactor, Rotating Biological Contactor and Sequential Batch Reactor to be effective for comparatively low organically loaded grey waste water

**GREY WATER CHARACTERISTICS-** The water requirement per capita for an average Indian household where sewerage system is present accounts to 135lpcd of which nearly 70L - 90L will be generated as grey waste water. The waste water characteristics of grey water in published literature were found to vary highly from individual household to community centers and also from one geographical location to another

There are two types of grey water characteristics as follows...

1. Physical characteristics
2. Chemical characteristics

## USE OF TREATED GREY WATER-

- Mopping
- Flushing
- Laundry
- Gardening
- Car washing
- Toilet

## CONCLUSION-

The incorporation of Grey water recycling into hotels policies is important. Grey water reuse may help reduce costs of using fresh water. The use of Grey water has been practiced in many parts of the world for centuries. Based on the findings of this research, the following recommendations are made that hotels managers should consider recycling Grey water from their hotels for the many benefits which include economic and environmental benefits.

As grey water characteristics vary considerably with households, characterization need be done for individual households for arriving at the treatment options. Proper guidelines for reuse of grey water depending upon the socio economic conditions of a country will help in deciding degree of treatment required for various beneficial purposes. The available reuse standards are limited for the parameters TSS, Turbidity, BOD, Residual Chlorine and coliforms. The removal of phosphates and anionic surfactants are not considered in many of the studies as standards for them do not exist. In conclusion, grey water reuse systems offer a great option for creating an alternative water source mainly for non-potable uses, such as garden irrigation. This means reducing the pressure and demand on the potable water sources. There are also other options such as Waste Water Recycling. A number of different grey water reuse systems exist on the market and depending on the customer needs,

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