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# Effective Water Use Efficiency Improvement Strategies

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# EFFECTIVE WATER USE EFFICIENCY IMPROVEMENT STRATEGIES

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***Abstract***: *Better use of green water is essential to meet the UN Millennium Development Goals on poverty, hunger, sanitation and water. Agriculture can be made more water efficient in developing countries if farmers harvest rainwater or use small scale, inexpensive irrigation technologies. For example, perforated plastic tubes laid on the ground can deliver drips of water directly to where it is needed, at the base of planted crops. Water efficiency is obtained by optimizing the use of water and infrastructure through active participation by users with a sense of social responsibility.*

*This paper highlights various strategies implemented by various industries towards effective water conservation.*

***Keywords***: *water-use industries, efficient water fixtures, and wastewater reuse, behavioral practices.*

## INTRODUCTION

According to the report of International Water Management Institute (IWMI) , it takes 70 times more water to grow the food we eat every day than we need for drinking, cooking, bathing and other domestic needs The report also points out only 40 per cent of rainfall reaches rivers and groundwater. 60 per cent of green water that is either evaporated directly from the soil or taken up by plants before it reaches rivers and groundwater.

## FOUR MAJOR CATEGORIES OF WATER USE

**[1] Domestic**:
Water used for residential, commercial, industrial, and public uses such as street cleaning, fire fighting, municipal parks, and public swimming pools.

**[2] Power Plants:**
Power plants use 136 billion gallons of fresh water per day during
billion gallons of water per day extracted by private water systems Generally, water withdrawn for power plants is used f or cooling purposes , power plants use 136 billion gallons of fresh water per day.

**[3] Agricultural**: Water used to irrigate farm crops, for livestock, dairies, feedlots fish farms, and other farm needs. Agricultural irrigation accounts for more than 142 billion gallons of fresh water per day.

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**[4] Industrial & Mining**:
Water used for cooling in factories and washing and rinsing in manufacturing processes. Some of the major water-use industries include mining, steel, paper, and associated products, as well as chemicals and associated products. Industrial facilities withdraw more than 20 billion gallons of fresh water per day

**GOOD POTENTIAL FOR WATER CONSERVATION IN HOUSEHOLD USAGE**

Average daily household water use 350 gallons and average household water use annually is 127,400 gallons . By installingmore efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 35% to about 45.2 gallons per day.

| Type of Consumption | Water consumption in Gallons per capita | % of Total daily water consumption |
|---|---|---|
| Showers 8. | 8 | 19.5% |
| Clothes Washers | 10.0 | 22.1% |
| Toilets 8. | 2 | 18.0% |
| Dishwashers 0. | 7 | 1.5% |
| Baths 1. | 2 | 2.7% |
| Leaks 4. | 0 | 8.8% |
| Faucets 10. | 8 | 23.9% |
| Other Domestic Uses | 1.6 | 3.4% |

*Source: Handbook of Water use and Conservation, Amy Vickers*

**STRATEGIES FOR IMPROVING WATER USE EFFICIENCY**

**[1] Engineering Practices**

Dealing with modifications in plumbing, fixtures, or water supply operating procedures .

** **Water reuse:** It is the use of wastewater or reclaimed water from one application such as municipal wastewater treatment for another application such as landscape watering

** **Water recycling**: It is the reuse of water for the same application for which it was originally used. Recycled water might require treatment before it can be used again.

** **Cooling Water Recalculation:** In this water is used to cool heat generating equipment or to condense gases in a thermodynamic cycle.

** **Use of demonized water**: A common use of water by industry is the application of demonized water containing no ions, which tend to corrode or deposit onto metals.

**[2] Behavioral Practices**

Behavioral practices involves modifying water use habits to achieve more efficient use of water, thus reducing overall water consumption by an industrial/commercial facility.

Monitoring the amount of water used by an industrial/commercial facility can provide baseline information on quantities of overall company water use, the seasonal and hourly patterns of water use, and the quantities and quality of water use in individual processes.

The use of meters on individual pieces of water-using equipment can provide direct information on the efficiency of water use. Records of meter readings can be used to identify changes in water use rates and possible problems in a system

**RECOMMENDATIONS FOR SYSTEM OPERATORS**

** **Metering:** Billing customers based on their actual water use has been found to contribute directly to water conservation.

** **Leak Detection:** Repairing leaks controls the loss of water that water agencies have paid to obtain, treat, and pressurize.

** **Well Capping:** Well capping is the capping of abandoned artesian wells who's rusted casings spill water in a constant flow into drainage ditches.

** **Planning and Management Practices:** In addition to engineering practices, system operators can use several other practices to conserve water or improve water use efficiency.

** **Pricing:** Customers use less water when they have to pay more for it and use more when they know they can afford it.

** **Water Surcharges:** A water surcharge imposes a higher rate on excessive water use. Surcharges include unit surcharges, winter/ summer ratios, and alternative seasonal rates.

** **Retrofit Programs:** Retrofitting involves the replacement of existing plumbing equipment with equipment that uses less water.

** **Water Audit Programs:** Auditors visit participating homes to identify water conservation opportunities, such as repairing leaks and low-flow plumbing, and to recommend changes in water use practices to reduce water use.

** **Public Education:** These are used to inform the public about the basics of water use efficiency. Some examples are: bill inserts, feature articles and announcements in the news media, workshops, booklets, posters and bumper stickers, and the distribution of water-saving devices.

## HONG KONG WATER EFFICIENCY LABELING SCHEME FOR BATHING SHOWERHEADS

The Water Efficiency Labeling Scheme (WELS) covers the common types of plumbing fixtures and water consuming appliances. Products incorporate a water efficiency label that serves to inform consumers of its water consumption level and efficiency rating. Consumers should then be able to take these factors into account in making their purchasing decision. The WELS is applicable to manufacturers, importers, or other relatedparties with new showerheads imported to or manufactured in Hong Kong but does not include second-hand products, products already in existing use, under trans-shipment or manufactured for export.

## CONCLUSIONS

In many cases, efficient water use is not merely one more option, it is the only one. The technology, infrastructure and equipment for more efficient water use are available, but they are nevertheless not applied. Users' participation in efficient water use programs is limited, and they are generally unaware of what a water shortage problem really implies and what they themselves can do to use water more efficiently. There is a need to encourage efficient use programs at the watershed level, with clear definitions of users' roles within their own sphere of activity.

Water Efficiency continues to play an important role not only in protecting water sources and improving water quality, but also in reducing the amount of energy used to treat, pump and heat water . Water conservation is the most reliable and least expensive way to stretch the country's water resources, and the challenge is being met in all sectors. Water efficiency is the long-term ethic of saving water resources through the employment of water-saving technologies and activities. Using water efficiently will ensure supplies for future generations.

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