



Research Paper

A study on the awareness of water conservation among students and their perception of water related risks in Kashmir

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Abstract: Water being the most vital element of nature, is therefore the very basis for all life on Earth. Water has become a matter of concern for the modern world and its International organizations, such as the UN- officially designating a yearly World Water Day observed on 22 March. Sustainable development will not be achieved without a water secure world. A water secure world integrates a concern for the intrinsic value of water with a concern for its use for human survival and well-being. A water secure world reduces poverty, advances education, and increases living standards. It is a world where there is an improved quality of life for all. In this paper, we discussed the students' awareness and attitude towards water conservation. The quantitative data was collected using a well-designed questionnaire based on the previous literature. In this study, we used stratified sampling technique to collect the data from 400 students studying in various

colleges of Kashmir valley. The data collected was analyzed using SPSS statistical package software. Results revealed that while most of the students had a favorable attitude towards water conservation, many of them gave no thought to the amount of water they consumed each day. It was found that the majority of participants did recognize the importance of water conservation but they did not necessarily conserve water themselves. Results showed that significant relations exist between perceived water consumption and actual water consumption. The students who could accurately estimate water consumption were found to have better water conservation consciousness and water conservation practices than those who would underestimate their water consumption. Female students understudy had significantly higher levels of awareness of water use than male students. Water

related risks including water scarcity was discussed.

Keywords: Water, Water Conservation, Water scarcity, Environment, Awareness, Attitude, Kashmir, Statistics

INTRODUCTION:

Water is the most fundamental resource for human survival besides the air we breathe. It is used in practically every human endeavor one can think of. Water is essential to life because it heavily influences public health and living standard. Water covers 71% of the Earth's surface and is vital for all forms of life. Water conservation includes all the policies, strategies and activities to sustainably manage the natural resource of fresh water, to protect the hydrosphere and to meet the current and future human demand. Population, household size and growth and affluence all affect how much water is used. Factors such as climate change have increased pressures on natural water resources especially in manufacturing and agricultural irrigation. One of the most important problems in today's world is environmental problems. Although climate change has been attributed to various reasons during the period from the Industrial Revolution until today, scientists have reached a consensus as to the fact that environmental problems with regard to climate have emerged due to human activities. Most people are unaware of how important water is and why it should be conserved. As populations increase so too does the demand for water. Water conservation therefore, has become an important consideration for countries, governments and cities. To develop effective water conservation policies and intervention strategies aimed at encouraging water saving behavioral change (including both the adoption of water efficient appliances and the implementation of water saving

practices) an understanding of users' perceptions, attitudes, and values is needed. It is mostly difficult to think of saving water when it always seems to be available every time we turn on the tap. It's often noticed that the only time a person becomes aware of water is when it is no longer there or they don't have any access to it. Educating people on how they can save water during their everyday activities is an important step in helping towards water conservation. Surveying people on how they think about water and the ways they use it and also the attitude they attribute towards water conservation can be used in developing an educational strategy that targets those activities where people are more inclined to be wasteful. Changing lifestyles will be crucial for maintaining resources in the long run and recent calls to maintain water supplies suggest that reduced residential consumption offers the largest potential avenue for conservation and understanding why people do or don't engage in water conservation practices is crucial. Pro-environmental behavior is the tendency to act in a way that poses the smallest impact on the environment. Pro-environmental behavior is influenced by knowledge, attitude, and intention. The theory of reasoned action suggests that attitude influences behavior and is mediated by intention. Attitudes concerning the environment are influenced by factual knowledge about the environment, social and moral values and intention to act in a more pro-environmental way. The factors contributing to pro-environmental behavior are essential to understand. Factual knowledge can be seen as a precondition of environmental attitude. To develop effective water conservation policies and intervention strategies aimed at encouraging water saving behavioral change (including both the adoption of water efficient appliances and

the implementation of water saving practices) an understanding of users' perceptions, attitudes, and values is needed.

REVIEW OF LITERATURE

An overview of prior research investigating awareness and attitudes related to water conservation is provided below:

There has been a significant body of research conducted by various water authorities and governments around the country to establish the water use behaviors of the public. These studies have provided valuable insights into water behaviors and have established that water use often differs depending on location and factors such as climate, water use restrictions, and ownership of household water use appliances. Outdoor water use tends to account for a smaller percentage of household water consumption but is more variable than indoor water consumption due to seasonal changes in demand. Askew and McGuirk (2004) researched water behaviors and attitudes, particularly related to gardens. They surveyed 48 residents of new suburbs in New South Wales and found that 71% of respondents indicated that they use mulch in their garden, 63% have water efficient plants, and 54% have a water efficient lawn. Dessai and Sims (2010) also found that people's awareness of water shortages or their understanding of the impacts of climate change seems to have little bearing on their willingness to accept incentives to use less water. No statistically significant relationship was found between people noticing more water shortages and their willingness to pay more for water or to accept water restrictions to mitigate the effects of climate change. The literature review also found that technological interventions e.g. improved plumbing, water products, fixtures and fittings, are a useful baseline for water efficiency in buildings.

However, technological fixes alone is often enough, consumer attitudes and behavior often affect the levels of savings achieved (Uzzell, 2008). However, as Gilg and Barr (2006) observed, behavior is difficult to influence. Better results are achieved if through engagement and participation, the individual's adaptive capacity is improved, enabling them to make the choice to change. Another approach is to remove the barriers that limit the ability to act in a sustainable manner. If people seem to be acting in environmentally damaging ways it may be a product of their attitudes and behaviors, but it may also be a function of the conditions in which those attitudes and behaviors are formed.

Behavioral change regarding water consumption is perhaps one of the most sought-after objectives of water conservation policies, especially during times of drought (Hurlimann *et al.*, 2009). To this end, water planning and management must consider awareness campaigns as a tool to reduce water demand and therefore ease drought impacts as well as the pressures on the development of new water supply sources (Michelsen *et al.*, 1999). The most pressing problem before the world and humanity is not the fear of outbreak of war, epidemic or the collapse of civil administration but the daunting problem of water scarcity (Jury and Vaux 2006). Water scarcity causes great hardship to families. Water is essential to life and it works as a foundation stone for social and economic development of any country in the world. It is used mainly in the domestic, agricultural and industrial sectors. Moreover, food production is essentially a function of water availability at farm levels. Rising population and urbanization coupled with climate change may reduce water supply globally during the twenty-first century (Murad *et al.*, 2007). There is a

huge competition for water consumption from industrial sector, urbanization and agricultural crops. In future, even more water will be needed to produce food because the Earth's population will rise to 9 billion by the end of year 2050. Environmental degradation in many countries of the world is reducing human access to safe potable water. Recent growth in the global economy is having far reaching impact on water resources and their uses. Interestingly, changes in lifestyle and changes in consumption rate of water are also leading to pressure on fresh water resources. In India, as a result of population rise and economic development, the demand for water is increasing both in urban and rural areas. The per capita average annual fresh water availability has reduced from 5,177 min 1951 to 1,820 min 2001 and it is estimated to further come down to 1,341 min 2025 and 1,140 min 2050 (Kumar *et al.*, 2005). Decreasing availability may increase tensions and disputes over sharing of water resources. A large share of population from the poorer section of the society (both in rural and urban areas) loses their precious time in collecting water for their daily needs. Therefore, information on the water consumption pattern of a population (village) is essential in order to estimate the optimal planning of the available water resources. Such type of investigations assumes importance in preparation of a comprehensive water policy for the rural areas which will satisfy the growing needs of the villagers.

According the research conducted by Grafton *et. al.* (2011), in 10 different countries (Australia, Canada, Czech Republic, France, Italy, Korea, Mexico, Netherlands, Norway and Sweden) with the participation of about 10 000 households, results suggest that household size, residence size, education, employment status

and household income had positive and significant effects on household water consumption. Willis *et. al.* (2013) results indicated that residents with very positive environmental and water conservation attitudes consumed significantly less water in total and across the behaviorally influenced end uses of shower, clothes washer, irrigation and tap, than those with moderately positive attitudinal concern. Khalid *et. al.* (2016), investigated water conserving behaviors in Pakistan. They found that females, housewives, participants with low education, adults (age range 41-50) and families of 7 to 9 members had more water conserving behaviors. Zietlow (2016), the socio-demographic and psychological determinants of water conservation behavior, based on three distinct datasets from Germany and Jordan. The results indicate that water conservation does not differ with respect to age, education, and income, but rather with different levels of environmental attitude. Similarly, Adams (2014) investigated the links between socio-economic characteristics and water conservation attitudes. He reported that socio-demographic variables such as income, age, and occupation were not significant correlations of water conservation behavior; only gender was a significant correlation of water conservation behavior. Study conducted by Boylu and Gunay (2017) revealed that the consciousness of sustainable consumption lead to lower levels of total water consumption in households. This can be explained by the fact that low educational level and lack of consciousness cause people not to conserve water. Therefore, to contribute in improving the consciousness, educational institutions should insert some topics on sustainable consumption in curriculum at all educational levels and mass media should seek to spread among people.

OBJECTIVES:

- To study the awareness levels among students towards water conservation.
- To understand student’s basic knowledge of water use and water conservation behavior.
- To identify the gender wise role in water conservation.
- To find out the perception of students towards water related risks.
- To know about the reasons leading to the wastage of water.

METHODOLOGY:

In the present study the survey included 400 students (200 boys and 200 girls), studying in various higher educational institutions of Kashmir valley. To collect information a well-designed questionnaire was prepared keeping in view the literature available on

the topic under study. The respondents who participated in this study were given a verbal explanation regarding the purpose of our study and were assured that confidentiality would be maintained throughout this study. The data was collected using simple random sampling technique, was tabulated and analyzed with the help of standard statistical techniques.

RESULTS AND DISCUSSION:

The data presented in Table 1 reveals that in response to statement awareness of bill amount 73% students were unaware. All respondents were heard of fixed bill pay mode. Majority of the respondents (54%) don’t know the actual source of their drinking water and 93% respondents don’t have any running water resource around their home.

Table 1: Awareness among students regarding water bill and source of water

<i>S.No.</i>	<i>Variable</i>	<i>Categories</i>	<i>Frequency (%)</i>
1.	Awareness of bill amount	Aware	108 (27%)
		Unaware	292 (73%)
2.	Bill Amount	Fixed	400 (100%)
		Variable	0 (0%)
3.	Perceived source of water	Rivers	148 (37%)
		Underground	36 (9.0%)
		Others/don’t know	216 (54%)
4.	Running water at/around home	Yes	28 (7%)
		No	372 (93%)

The data presented in Table 2 shows that 57% female and 43% male members in the family are more serious about water consideration. Further, 77% female and 23% male respondents are likely to teach children and family about water conservation. Majority 63% of the respondents believe that female wastes more water than male.

The results of our study are in agreement with earlier studies. It is reported that conventional female role as a local ‘caretaker’ extends to the protective attitude towards environment (Gronhoj and Olander 2007). Also, Women consume significantly more water than men as the result of higher level of involvement of women in chores

that require water consumption (i.e., washing dishes, watering plants, washing

clothes) and activities traditionally seen as “women duties”.

Table 2: Gender wise role in water conservation

Statement	Category	Frequency (%)
More serious about water consideration	Male	86 (43%)
	Female	114 (57%)
Likely to teach children and family about water conservation	Male	46 (23%)
	Female	154 (77%)
In your opinion who wastes more water	Male	74(37%)
	Female	126 (63%)

We measured the responses in a Liker scale with score 1 disagree and score 5 strongly agree.

Due to the erratic supply of water, the respondents correctly understand the scarcity of water in their area. However, the

respondents blame distribution as much as usage for causing this shortage. They believe that their role is a little more than the government’s role.

The responses are summarized below the table 3.

Table 3: Perception of students towards scarcity of water:

S.No.	Statement	Mean	S.D.
1.	Our locality is facing scarcity of water because of carelessness of people towards efficient use of water	3.72	0.63
2.	Human actions are influencing water availability	3.92	1.01
3.	Knowledge of impending water crisis for future generation	3.88	0.93
4.	Own role is significant compared to government’s role	3.58	1.10
5.	Distribution is not the problem, rather usage is	3.26	1.14
6.	Overall knowledge level of the issue	3.67	0.96

Table 3 reveals that the majority of the respondents agree that the main reason for scarcity of water is human actions, followed by water crisis for future generation, involving carelessness of people towards efficient use of water, followed by usage of

In the data presented in Table 4, we measured the responses in a Liker scale with score 1 disagree and score 5 strongly agree. Majority of the respondents agreed that main reason for water wastage is lifestyle and luxury, along with unattended children wasting water, followed by ignorance of

people towards the importance of water and by keeping taps running unnecessarily while doing laundry, washing dishes and also while gardening. It is observed that culturally, we are used to using many different types of cooking pots, utensils and serving dishes when serving our meals. Further, serving food to the guest is also an elaborate cultural affair and results in a lot of washing. It seems that people are not willing to changing this pattern. This is not surprising as previous research shows that

different methods of washing and doing laundry makes the control of water use highly dependent on the individual. For example, those washing dishes by hand may have different methods, such as pre-rinsing, rinsing and piling of dishes under running water and each one would have a different level of water consumption. These differences become very important when attempting to encourage households to reduce water usage within the home (Randolph & Troy 2008: 445).

Table 4: Common reasons for water wastage

S.No.	Statement	Mean	S.D.
1.	People ignore the importance of water	3.21	0.68
2.	Keeping taps running unnecessarily while doing laundry	3.68	0.74
3.	Keeping taps running unnecessarily while washing dishes	4.28	0.66
4.	Unattended children wasting water	3.14	0.78
5.	Keeping taps running to water gardens	3.76	0.62
6.	The lifestyle and luxury we are used to (e.g. using different types of utensils and crockery)	3.12	0.82

In the data presented in *Table 5*, we measured the responses in a Liker scale with score 1 being least important and score 5 being most important. The need for consumer-citizen participation in the development of more sustainable consumption patterns has been emphasized in the last decades (Gronhoj, 2006). For this reason, we asked the respondents a set of questions regarding their perception of personal effort on conserving water. The respondents strongly believed that water wastage is a serious issue for the environment. They also agreed that they

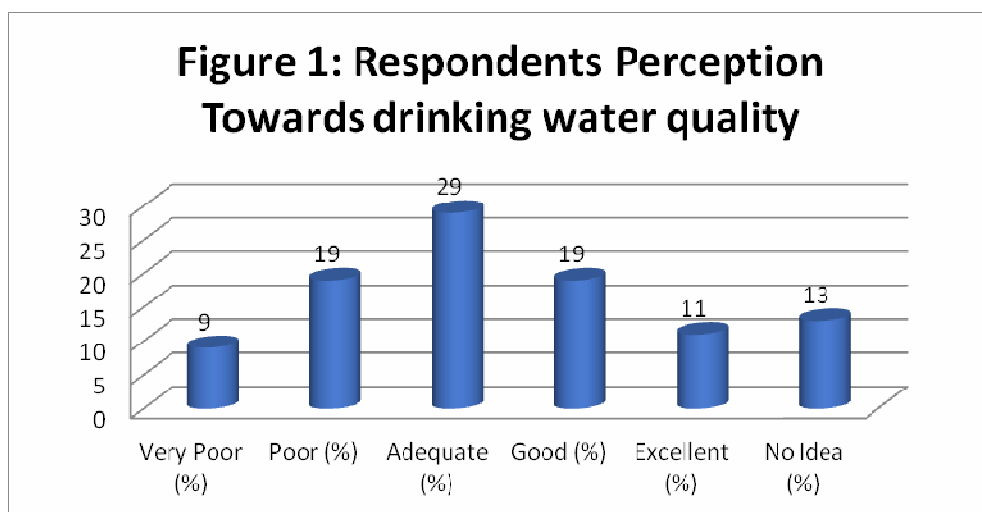
should continuously monitor and identify the causes of water wastage. The respondents in majority believed that changes in lifestyle would help in reducing water wastage. The findings of our study indicate that although most people are aware of the severity of water wastage and also the fact that they should take some action, but they have not taken any active steps to conserve water yet and are still unwilling to change their lifestyle. This reinstates previous studies environmental awareness does not lead to environmentally conscious behavior (Gregory and Lio 2003).

Table 5: Willingness among students to Make changes to save and conserve water

S.No.	Statement	Mean	S.D.
1.	Water wastage is a serious issue for the environment	4.32	0.69
2.	I should continuously monitor and identify what is causing water wastage in my household	4.12	0.71
3.	If I can make some changes in my lifestyle and household I will be able to save a significant amount of water	4.14	0.72
4.	I'm willing to work towards reducing water wastage	3.98	0.67
5.	So far, I already have taken several steps to conserve water	3.21	0.89

The data presented in figure 1 reveals that 29% respondents revealed that drinking water is adequate, followed by 19% each

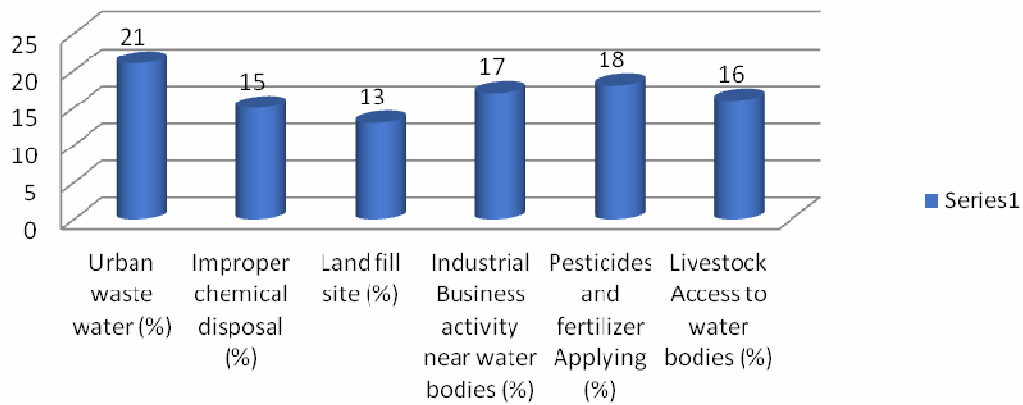
poor and good, followed by 13% having no idea, followed by 11% Excellent and 9% very poor.



The data presented in figure 2 reveals that 21% respondents felt that urban waste water has the most adverse effect on water quality followed by improper pesticides and fertilizer use (18%), followed by

industrial/business activities near water bodies (17%), followed by livestock access to water bodies, followed by improper chemical disposal.

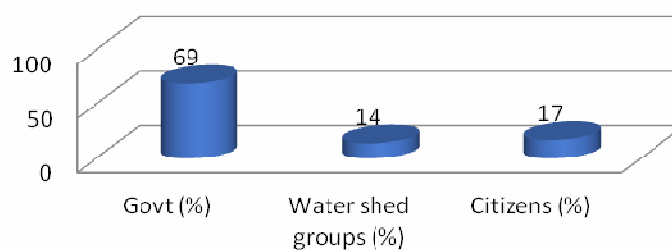
Figure 2: Perception of activities that most adversely affect water quality



The data in Figure 3 shows that 69% respondents believed that Govt is responsible for poor water quality followed

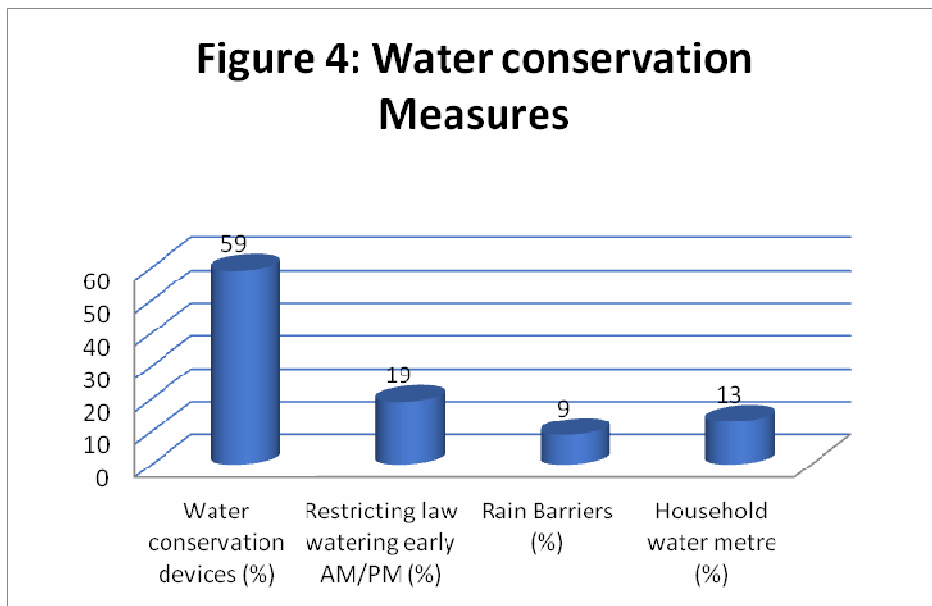
by 17% who believed that citizens were responsible and 14% believed that watershed groups are responsible.

Figure 3: Perception of who is most responsible for ensuring good water quality

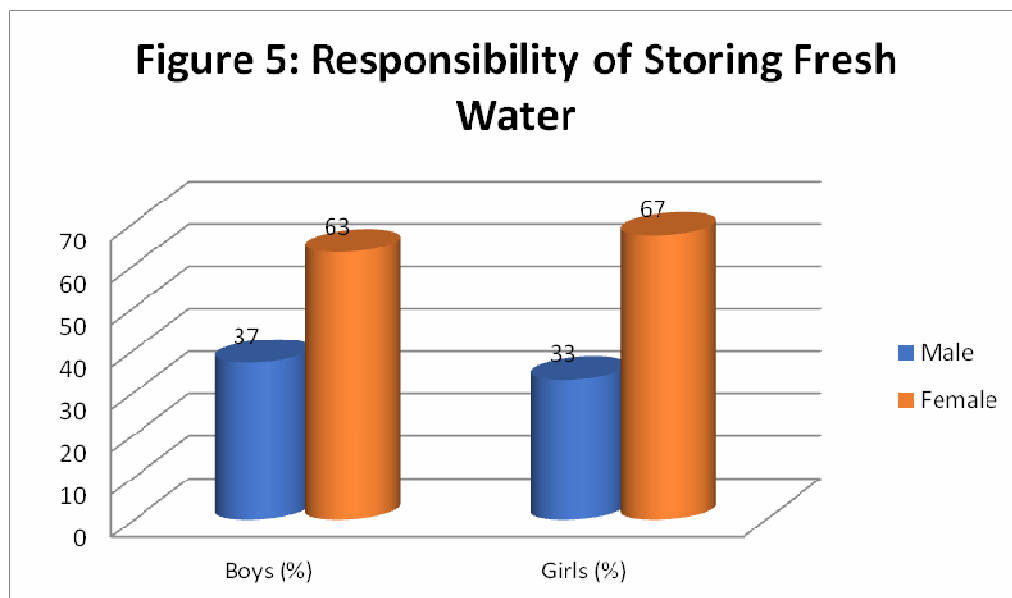


The data in Figure 4 shows the water conservation measures, 59% believed that they must have water conservation devices, 19% wanted that they must restrict watering,

13% told that they must have household water meters and 9% believed that they must have rain barriers for conservation of water.



The data presented in *Figure 5*, reveals that 63% boys and 67% girls under study were of the opinion that female family members are responsible for storing fresh water in house.



CONCLUSION:

The results of our study are very significant for many reasons. We realized that, since water consumption is a habitual behavior, it does not require much recognition to make everyday decisions. The level of association in water conservation is expected to be heightened when conservation becomes personally relevant. It was observed that the awareness about scarcity of water among students is not that high and so campaigns need to be designed to show how exactly everyone is going to get effected by this. The study showed that the domestic helps can play a significant role in water conservation and the biggest problem identified was the lack of proper education. Girl students were found to be using more water than the boys. We do not understand the importance of long term thinking over shortterm benefits. The reasons for water wastage included lifestyle and luxury, along with unattended children wasting water, followed by ignorance of people towards the importance of water and its use. The respondents also blamed government activities for adversely affecting the quality of water. The respondents in majority believed that changes in lifestyle would help in reducing water wastage. The findings of our study indicate that although most people are aware of the severity of water wastage and also the fact that they should take some action, but they have not taken any active steps to conserve water yet and are still unwilling to change their lifestyle. To develop effective water conservation policies and intervention strategies aimed at encouraging water saving behavioral change (including both the adoption of water efficient appliances and the implementation of water saving practices) an understanding of users' perceptions, attitudes, and values is needed.

RECOMMENDATIONS

- It is important to introduce moral environmental ideas that allows students to understand the importance of the environment, so they can develop appreciation for the natural world.
- Intensify water conservation program educational activities.
- Monitoring and mending the leaks and dripping taps on time.
- Exploring culturally appropriate messaging and education through comparisons of beliefs and values of diverse sub-cultures to enhance water conservation.
- Household water metering should be universally implemented throughout the country.
- Modification of the current quota pricing mode into volume pricing to inform consumers about their actual daily water consumption.
- improvements in the transparency of water bills by adopting monthly or daily bills.
- Install water-saving showerheads, shower timers, and low-flow faucet at homes.
- The best time to water your lawn is between 10:00pm and 6:00am to reduce water loss from wind and evaporation.
- For quick sanitation purposes, a full hand wash using water is not needed,

and alcohol-based sanitizer can be used instead.

- Plant in the Spring or Fall, when watering requirements are lower.
- Expand research, development, and application of new technologies to improve water conservation efforts.

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