

Water Conservation Manual



Acknowledgements



Bismillah ir Rahman ir Raheem

In the Name of Allah, The Compassionate, The Merciful

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And it is He Who sends the winds as heralds of glad tidings, going before His Mercy (rain), and We send down pure water from the sky, (Quran 25:48)

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Introduction

This manual is designed to highlight the importance of water conservation and explore the importance of water conservation in Islam. We hope to raise awareness of how water conservation can help towards preventing water shortages, improve sanitation and reduce waterborne disease.

The goal of this Water Conservation Manual is to motivate and encourage individuals (adults and youth) and institutions to change their water use practises by providing easy to follow information and facts on water conservation as well as recommendations and techniques that you can use.

"We made from water every living thing"(Qur'an 21:30).

There is no doubt that fresh water is our most precious natural resource and a valuable gift from Allah. It is essential for life and without it we would perish. Bangladesh, like many countries in the developing world, is facing shortages of clean, fresh water and this can be caused by unsustainable use and waste. In some areas, the available supply of water is being pushed to its limits due to increases in population size and crowded living conditions. Therefore, we have a responsibility to conserve water and use it wisely to protect this natural resource and ensure everyone has easy access to safe drinking water.

"O children of Adam! Wear your beautiful apparel at every time and place of prayer: eat and drink: but waste not by excess for Allah loveth not wasters" (Qur'an 7:31)

Our need to use water every day for food, drink and purification does not excuse wasteful habits. We must value pure water and use it wisely to make sure that we have enough to meet our needs as well as the needs of the environment, now and in the future.

This manual highlights the responsibilities of different groups; individuals and religious officials, in the process of conserving water.

The Significance of Water in Islam

And it is He Who sends the winds as heralds of glad tidings, going before His Mercy (rain), and We send down pure water from the sky, (Quran 25:48)

Water is an integral part of Islam. All of Creation relies on water as a source of sustenance and purification, but it is of particular importance in Islam because of its use in purification when performing wudu (washing before prayer) and ghusl (bathing).



As Muslims, it is important to acknowledge water as one of the immense mercies Allah has bestowed upon us that gives life and purifies mankind and the earth.

With this in mind, the believers are also frequently reminded that it is God who provides clean, 'sweet' water for the people to use and it is a blessing and mercy from Him that He can just as easily withhold.

*“And have you seen the water that you drink?
Is it you who brought it down from the clouds, or is it We who bring it down?
If We willed, We could make it bitter, so why are you not grateful?” (Qur’an 56: 58-70)*

In this verse, there is a clear reference to the privilege of clean water and a reminder that God’s creation is not in a position to waste such a valuable resource and we do not have the power to replace it when it is gone. Those who have knowledge of the Hereafter know that every person will be questioned about how we used our blessings so it is of the utmost importance that we do not become mindless of the natural resources we have, especially water.

And Allah has hated for you ...to waste the wealth (by extravagance with lack of wisdom and thinking). *Sahih Bukhari Chapter No: 42*

Conservation is not a new concept to Islam.

The Quran teaches mankind that we are the guardians of the earth and as such, have a responsibility to protect and preserve it. The Islamic system of living says that conservation of water is necessary at all times, even at times when water is plentiful as well as times when there are only drops left. Even in exceptional circumstances like war, Islam orders that water, along with other necessities of life, should be saved and not harmed in any way.

Water conservation is the responsibility of each and every person.

Given this, it is surprising that Islamic teachings are not being used more widely to promote water conservation in predominantly Muslim countries. It offers a basis for teaching people about conservation and a motivation for them to stick to it.

If all the guidelines of Islam are followed and every person fulfils his or her responsibility, then global water scarcity can be combated and overcome, with the help of Allah.

Why Clean Water Is So Important

“Have not those who disbelieve known that the heavens and the earth were joined together as one united piece, then We parted them? And We have made from water every living thing. Will they not then believe?” (Qur’an 21:30)

Water might be everywhere, but one must never take it for granted. It is essential for life and the Quran emphasises its centrality.

Did you know;

- The human brain is made up of 95% water
- The human body is made 70% from water.
- Blood is 82% water and lungs 90%.
- A mere 2% drop in our body's water supply can trigger signs of dehydration such as headaches, lack of concentration and tiredness.
- The World Health Organisation (WHO) findings are that each person requires access to a minimum of 20 to 50 litres of water per day for drinking, food preparation, and personal hygiene for all members of the household. Islam teaches that this access is also a basic human right.



So our bodies require a minimum amount of clean, pure, natural water each day to maintain good levels of hydration.

Drinking water should be fresh water that does not contain harmful substances, chemicals or organisms that will cause illness or spread disease. Sadly, the world’s supply of fresh clean water is being degraded and depleted, often caused by population growth, economic and agricultural development, pollution and waste. This water shortage affects those in the poorest countries the most and even when water is abundant it is often unsafe to drink.

Polluted water is not just dirty- it can be fatal!

According to the World Health Organization waterborne diseases account for about **1.8 million deaths** annually with **children and women being affected the most.**

Goal 7 of the Millennium Development Goals (MDGs) is aimed at ensuring environmental sustainability. One of the targets of Goal 7 is to halve the proportion of the population without sustainable access to safe drinking water and basic sanitation by 2015.

For these reasons, it is essential that we not only work towards conserving water, but also to ensuring that water is sanitised and safe for use.

Dirty Facts



- **80% of all diseases and 25% of all deaths in developing countries to polluted water.**
- **1.4 million children die** every year from preventable diarrhoea caused by unsafe water and poor sanitation. This is equal to 160 school classrooms of children every day. (WHO 2002).

- **Diarrhoea kills more children every year than AIDS, malaria and measles combined.** (WHO 2008)
- At any given time, nearly 50% of people in the developing world are suffering from one or more of the main diseases associated with dirty water and inadequate sanitation such as diarrhoea, guinea worm, trachoma and schistosomiasis. (UNDP: Human Development Report (2006))

Around the world, 884 million people do not have access to safe drinking water and 2.5 billion are without adequate sanitation facilities.

Did you know;

Excessive numbers of bacteria, fungus and viruses or harmful chemicals from human and animal wastes, fertilisers and industry can make some water unsafe to drink and cause water-related diseases.

When water sources are not protected, or are unexpectedly contaminated for any reason; the quality of drinking water suffers.

- Diarrhoea
- Hepatitis A
- Cholera
- Salmonella food poisoning
- Dysentery
- Polio
- Typhoid
- E-coli

- Intestinal parasites

Water-related (or waterborne) diseases are illnesses transmitted through contact with contaminated water during bathing, washing and drinking.

The most common are:

good health!

Simply put, clean water is essential for

Water Shortages in Bangladesh

Bangladesh is not only facing water scarcity but problems with water quality as well. Although there is plenty of surface water from ponds lakes and rivers in most parts of the country, much of this water is not safe to drink. Surface water in Bangladesh is used for bathing by people animals and sometimes as a sewer when there are no latrines available. Dirty water carries disease and causes sickness; most frequently, diarrhoea which can be fatal vulnerable children under 5 years old. Progress is being made, with a population of 160 million and rising, the demand for clean water often outweighs the supply.

45% population of Bangladesh live in poverty

32million people in Bangladesh lack safe drinking water

84% of people living in rural Bangladesh do not have access to latrines or toilets

Over 100,000 children die in Bangladesh each year of diarrhoeal disease

Rapid population growth and overcrowding in urban areas, poverty and poor housing and unhealthy disposal of waste all play major roles in the water and sanitation the major concerns facing Bangladesh today. Ground water levels are decreasing and during the dry season, tube wells will dry up and the rain that falls during the monsoon season are not enough to replenish all the tube wells fully.

A Salty Problem

Drinking water in Bangladesh is often full of sea salt as rising sea levels force water further inland. Local ponds that were the usual source of water are now full of salty water.

'We have to walk this long way to the desalinisation plant as the water in the pond in our village has turned too salty and muddy to drink,' says Khadiza, in search of fresh water.

PANOS London, 2008

For example, hundreds of women walk long distances to the desalinisation plant in Tatalbaria, a remote village in the Bagerhat district in south-west Bangladesh, just to get a pitcher or two of clean drinking water and many have to repeat this journey multiple times each day.

Salinisation (increasing salt), of surface water has always been a problem in low lying coastal regions of Bangladesh but the muddy salty water is moving further inland year by year. Population growth has put the existing water sources under immense stress, especially in urban centres which have experienced massive immigration from the rural parts of the country.

Bangladesh sits in the delta of three major river (the Ganges (Padma), Brahmaputra (Jamuna) and Meghna). These water bodies are heavily polluted, full of sediment and slow moving, due to

monsoon floods, irresponsible disposal of industrial and municipal untreated waste. This leaves ground water as the sole source of drinking water in crowded major cities.

Apart from industrial sources, surface water in the country is also extensively contaminated by human faeces as sanitation in general is poor.

Unsafe water sources are being used by local communities which have led to the spread of water related diseases.

24% of all deaths in Bangladesh are related to dirty water.

The trouble with arsenic... Arsenic contamination of ground water has increased in parts of Bangladesh since the early 1990s. It occurs naturally in ground sediments, but can be found in some industrial and agricultural waste. It is estimated that ground water sources in at least in 59 out of 64 districts have been contaminated with Arsenic, affecting over 70 million people. Arsenic poisoning has been linked to a number of illnesses including stomach pain, nausea, diarrhoea, blindness, numbness and partial paralysis and a number of cancers.

Bangladesh is a country in need of safe water. It is essential that we make an effort to save as much of the clean water as possible that we do have through conservation. Water can no longer be considered a totally free resource, and plans must be developed for its efficient use through better management and rules that preserve everybody's access.

Sujol Village Case Study

The Sujol Project is a social enterprise that aims to provide millions of Bangladeshi with arsenic-free drinking water within the next ten years. It will identify, develop and support micro drinking water businesses owned and operated by local entrepreneurs that provide affordable drinking water to their communities.

The focus is on the rural and peripheral urban areas of Bangladesh where there are serious arsenic contamination and salinity problems with existing tube wells.

Developed by Voltea, a Unilever Ventures company, CapD-I is an innovative, low energy, non-chemical water filter that can remove ions, such as salt and arsenic, out of water to make it safe to drink. It is affordable and accessible to rural communities and can be used by locals to as a solution to the issue of arsenic poisoning which is so prevalent in Bangladesh.

Sujol plan to train a number of locals to install, run and maintain the water treatment plants and to develop up to 30,000 financially independent micro water businesses. There is a test village at Kalaroa, to measure the viability of the technology.

Early response has been positive as there are few, if any, ways of producing water of its quality (with regard to arsenic, saline, iron and germs) available in rural Bangladesh.

For more information visit <http://www.akvo.org/rsr/project/276/>

What is Water Conservation?

Water conservation simply refers to reducing the usage of water and recycling waste (used) water. Any beneficial reduction in water loss, water use and water waste can be classed as water conservation, as well as preserving the quality of the water we use.

In order to conserve the water that is available to us, improved water management systems need



to be put in place. Thus, water conservation requires action; Behavioural change, modifying the devices and technology we use.

Water conservation is vital in Bangladesh because clean water supplies are very limited and the way we use water at the moment is not sustainable.

In poorer rural and urban communities there is little or no access to safe water and often families have no option but to buy water from vendors. There is still no guarantee that the water from these merchants is clean and safe to use either.

Why Conserve Water?

One of the most obvious reasons to practice water conservation is in a situation where water supplies are limited.

"We made from water every living thing"(Qur'an 21:30).



Earth.

We have the same amount of water in the world now as when the Earth was created.

- Approximately **97%** of this water is salt water and therefore not suitable for drinking.
- The remaining **3%** has to be used by every living creation on

This is not much water to go around. The sensible course of action to take is that we preserve and sustain the water that is available to us.

Since each of us is made from water and is dependent on water, it is our responsibility to conserve the water that we use and learn how we can keep it pure and safe for generations to come.

Ensuring that our brothers and sisters in all parts of the country have easy access to safe drinking water is our responsibility as Muslims.

A significant number of the male population will attend the local Mosque for Friday Prayer and the Imam's khutbah [lecture]. The Imam is a highly influential and respected member of the community and people will listen to what they say. If the Imam were to add a regular topic on water conservation in a religious context people would certainly take note. This offers an opportunity that is too good to miss. Islam has an active audience of millions of people who can be informed about water conservation.

Ask yourself;

Can I make better use of this water?

Do I really need as much water as I am using?

Should I be pouring this water away or can I reuse it later?

Can I collect it this extra water?

Water Saving Guidelines

Saving water is easy for everyone to do as there are a number of little changes that you can make to save water.

Here a number of easy ways you can save water:

- Locate and fix leaks and dripping taps to reduce water wasted.
- Plastic containers (such as plastic milk jugs) can be filled with sand or pebbles and placed in a toilet tank to reduce the amount of water used per flush, saving up to a gallon per flush. Be sure that it does not interfere with the flushing mechanisms or the flow of water).
- Turning off a running tap when it is not needed, such as when lathering soap to wash your hands, brushing your teeth and shaving.
- Fill the sink with water when washing fruit, vegetables and dishes by hand rather than leaving the tap running.
- Encourage your family to take shorter showers. Cutting your shower time down by one minute per person can have a substantial effect on reducing your water bill.
- Use the minimum amount of water needed for a bath by closing the drain first and filling the tub only 1/3 full. The initial burst of cold water can be warmed by adding hot water later.
- Only washing clothes and dishes when there is a full load that needs to be washed. Washing dark clothes in cold water saves both on water and energy while it helps your clothes to keep their colours.
- Wash food, clothes and utensils by filling up a washing up bowl, rather than leaving the tap running.
- Collect water from washing machines and reuse it to mop floors and flush toilets.

- Avoid flushing the toilet unnecessarily. Dispose of tissues, insects and other such waste in a rubbish bin rather than the toilet.
- Use a barrier when picking things up that would require washing hands after, such as a towel, tissue or gloves to reduce the frequency you need to wash your hands.
- Recycle and reuse water that has been used for something else, such as collecting the water you use for rinsing fruits and vegetables, and then reuse it to water plants or flush toilets.
- Rain water harvesting: You can prepare for the dry seasons by making the most of the wet seasons and collecting rain water in a rain barrel to use later.
- Only water plants when necessary, more plants die from over watering than from under-watering.
- Preferably water in the morning or evening when temperatures are cooler to minimize water loss through evaporation and apply water only as fast as the soil can absorb it.
- Finally one should aim to increase the awareness of water conservation among, friends, family and colleagues by passing on the information found in this guide, this can be through word of mouth or by making sign promoting water conservation.

What is water Sanitation?



Water sanitation means ensuring everyone in the country has access to clean and pure drinking water, free from harmful and unpleasant contaminants. Sanitation programs maintain the quality of this water at a standard where it is clean and safe to drink and use.

Around 70% of the population of Bangladesh live in rural areas and do not have adequate access to sanitation (e.g. proper drainage systems, sewers, and latrines). Improving rural sanitation is complicated. It is not just a matter of infrastructure, individuals need to be aware of how their own behavior may damage the environment and what they need to do to protect their own and public health. Improving the availability and quality of water requires education of the whole family, adults and children.

It is no secret that improved sanitation could prevent more than 1million deaths from diarrhoeal illnesses per year but this is not where the benefits end. Improved sanitation directly impacts the lives of people by allowing them to live with dignity, privacy and safety, especially women and girls, as well as protecting our water sources.

Thousands of tonnes of human excrement are not disposed of properly and, left untreated, leads to much of it ending in ponds and rivers because people have no access to latrines and sewage systems.

“Half the slum is knee-deep in water during high monsoons. There is no electricity, no water supply. And the worst is that we do not have toilets,” said Tara Mia, a vegetable hawker who lives with his wife and three children in a Dhaka slum.

Poor sanitation, water and hygiene have many other serious repercussions. In particular, girls are denied their right to education because their schools lack suitable sanitation facilities. Women are forced to spend large parts of their day fetching water. Poor farmers and wage earners are less productive due to illness, health systems are overwhelmed and national economies suffer.

More Dirty Facts:

- Lack of sanitation facilities forces people to defecate in the open, in rivers or near areas where children play or food is prepared. This increases the risk of transmitting disease. The Ganges river in India has 1.1 million litres of raw sewage dumped into it every minute, a startling figure considering that one gram of faeces may contain 10 million viruses, one million bacteria, 1000 parasite cysts and 100 worm eggs. *WHO- 10 Facts on Sanitation, March 2011*
- Hygiene education and promotion of hand washing are simple, cost-effective measures that can reduce diarrhoea cases by up to 45%. Even when ideal sanitation is not available, instituting good hygiene practices in communities will lead to better health. Proper hygiene goes hand-in-hand with the use of improved facilities to prevent disease. *WHO- 10 Facts on Sanitation, March 2011*

Water Sanitation Guidelines

Here are some water sanitation tips to improve the quality of water and kill germs to reduce the transmission of waterborne diseases:

- Always wash your hands with soap and clean water before eating and after going to the bathroom or handling dirty items. It is estimated that washing hands with soap would reduce the number of diarrheal diseases by a third.
- Special attention should be paid that children wash their hands because of exposure to pathogens while playing with contaminated water and ground.
- Try to only take drinking water from safe sources like handpumps or protected wells, rather than rivers or ponds.
- Avoid eating any food that has been washed in dirty water.
- Boiling water for at least one minute can kill germs.
- Thoroughly wash any food or drink containers with soap and hot water after use.

- Keep your toilet clean by cleaning it thoroughly with soap and water, always keep the seat down and door closed.
- Store water in closed containers. Do not drink water left in open containers for long periods of time.
- Go to the toilet at a safe distance from water sources that are used for drinking, cooking or other household purposes.
- Making drainage channels or soak pits to take wastewater away from wells and homes.
- Ensuring animals are kept away from houses, water sources and latrines.
- If using water from a contaminated source using a simple water filter can dramatically improve water quality.
- The best way to reduce water related illnesses is to raise awareness of the risk associated with drinking contaminated water and educating people about standards of hygiene.

Who is responsible for Water Conservation?

We have outlined the importance of water and the threats it's facing in Bangladesh, but whose responsibility is water conservation and water sanitation. Conservation is not only the responsibility of the religion and religious people.

Civil Society

We all have a community responsibility to protect the world where we live and conserve water for ourselves and others no matter how much we use. We all need to think globally, and act locally. This means remembering our actions will have impacts felt by the entire planet but we can help this by taking action in their own communities and cities. We are responsible for reducing our water usage and helping other reduce theirs.

Individuals

The dwindling availability of water, including rainwater, surface water, and groundwater requires sustainable management, a responsibility that has to be shared collectively and individually by members of the society not just one part of it. Every individual in wider society has a responsibility to conserve water in their day to day life.

Government

The national and local government obviously have a duty to protect their citizens and the resources they rely on. The Government has realised that water is not an infinite resource and have recently drawn up a National Water Policy to bring order to the exploration, management and use of water resources in Bangladesh. However they can only do so much without the help of local people and organisations, they can fix leaks and provide infrastructure but they cannot stop people wasting water.

Businesses and Public Institutions

Businesses and public institutions, like schools and hospitals, have as much responsibility to conserve water as households do because they tend to use more water and have access to more people in the workforce.

The tips listed above should not only be implemented at home but at work also. Just think how much water could be saved in a school with hundreds of students or a business with dozens of employees. For example you could establish a water monitoring team at work or in a school using pupils, getting staff to report on leaks, dripping taps, and faulty toilets. They could also design and create signs giving hints and tips on how to save water both at work, in school and at home. Place them near taps, toilets and showers, reminding users to save water.

Schools have a particular responsibility because they have access to hundreds of children who may not know the importance of water. Teachers could use a small portion of the school day to teach children about the importance of water conservation and consequences of wasting water. They are quick learners and can be used to pass on their learning to other family members dramatically reducing the amount of water wasted in the local area.

It also makes sound business sense to save water because it will save money too, many water saving options that cost money will more than pay for themselves in year or two.

NGOs

Non-Government organizations (NGOs) comprise the sector of society that attempts to hold business and other institutions accountable for their social responsibility.

There are more than forty thousand NGOs operating in Bangladesh working with the government to help the people and protect the environment. There are a number of projects underway by different NGOs working towards promoting water conservation, water sanitation and the production of sustainable clean water for poorer communities.

They have a responsibility to incorporate elements of water conservation into the work they are doing, even if the work they are undertaking is not directly linked to water. They have the resources, information and access to people to promote water conservation through group meetings, IEC materials, campaigns and workshops.

Think of the number of people who could be accessed and educated on water conservation if the NGOs starting promoting water conservation in their projects.

Water Conservation Guidelines for Medical Facilities

Hospitals and Medical Facilities can save costs with water efficiency.

Here are some ideas;

The Basics

- **Educate** staff about water conservation (inc. posters and signs)
- **Increase patient and visitor awareness** of water conservation (e.g., signs in patient rooms and restrooms, publicize water conservation policy)
- **Find and fix** drips, leaks, and unnecessary flows in bathrooms, laundry, kitchen, labs, etc.

Domestic Water Reduction

Older buildings typically waste a huge amount of sanitary water. For example, one leaking toilet alone can waste more than 50 gallons of water every day;

- **Toilets and urinals.** Whenever possible, when toilets are being replaced, upgrade to low-flow models.
- **Sinks and showers.** Install flow reducers (flow of less than 2.5 gallons per minute is good) and aerators on applicable plumbing fixtures.

These measures are particularly effective at reducing costs.

Process Equipment

- **General.** As appliances and equipment wear out, replace with air cooled or water-saving models.
- **Sterilization equipment.**
 - Replace water-induced vacuum devices on sterilizers with electric pumps (retrofit kits are available).
- **Refrigeration equipment.** Recover condensation from refrigerators, freezers and ice makers for reuse.

Water Reuse

Greywater is defined as non-industrial wastewater generated from domestic processes such as

dish washing, laundry and bathing. Essentially, any water, other than toilet wastes, draining is greywater. Greywater is a major fraction of domestic and municipal wastewater which is generally less polluted than other types of wastewater [A. Khatun & M.R. Amin, 2011.]

Greywater can be treated and reused fairly easily.

Water Supply/Systems

- **Sprinklers.**
 - Minimize water use for irrigation
 - Investigate sources of used water.
 - Collect rainwater.

Laundry

- Washers.
 - Reprogram machines to eliminate additional rinse cycles, if possible.
 - Wash full loads only or reduce water levels to minimize water required per load of washing.

Conclusion

Water is our most precious resource, but it also our most degraded one. Water shortages are one of the biggest issues facing mankind today, without adequate access to clean water to drink and wash with people get ill and eventually die. We are running out of clean water so we must protect what we have left.

Islam teaches us to preserve the world we live in because it is a gift from God and is not to be taken for granted. But we are taking water for granted, we are not all using it as sensibly as we should. We are wasting an unnecessary amount of water, while there are people all around the world who do not have access to clean water. We have a responsibility as humans and Muslims to conserve the water we do have and not to expect other people to do so for us no matter where we live. But this is especially true when we live in parts of the world with shortages of clean water, like Bangladesh.

Water conservation is the responsibility of everyone. Not just the government or the NGOs or big businesses. Everyone needs to manage their water use.

It is very straight forward, and we have suggested a few simple ways in which you can reduce the amount of water you use at home and at work. However the real challenges is not only finding ways to save water but making an impression on other people and getting them to alter their behaviour and implement the water saving tips.

To do this we need to use all available channels, including local institutions, schools and mosques, to raise public awareness and convince people that it is not only in their interest but it is their responsibility to save water.

So please take note of the information inside this manual and pass it on to friends, family, colleagues and anyone you think it may find it useful.

Appendix

The Qur'an *Yusuf Ali translation*

Islam and Water: The Hajar (r.a.) Story and Guide *by Dr Husna Ahmad OBE*
Global One 2015 Published by Global One 2015, London 2011

Water Conservation Manual for State of Hawaii Facilities

Greywater reuse: a sustainable solution for water crisis in Dhaka, Bangladesh A. Khatun & M.R. Amin, *Bangladesh University of Engineering and Technology, Dhaka, Bangladesh*

Sahih Bukhari

Useful Websites

49 Ways to Save Water- <http://www.gdrc.org/uem/water/49-ways.html>

<http://hdr.undp.org/en/media/HDR06-complete.pdf> page 45)