



Water Challenge Badge



This booklet is intended as a guide for teachers and youth leaders. These individuals are responsible for the development of programmes and activities which are suitable for their group and provide the required supervision and safety precautions to ensure all participants are safe and sound.

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Water Challenge Badge

Developed in collaboration with



The World Association of Girl Guides and Girls Scouts (WAGGGS) and the World Organization of the Scout Movement (WOSM) endorse this educational badge framework for use by Guides and Scouts around the world, adapting it as necessary to their local needs and requirements.

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WELCOME

“ Water is life.
EVERY human, animal
and plant on this earth
needs water.”

Can you imagine not using any water for a day? It's almost impossible, and certainly not comfortable! Almost all man-made objects require the use of water at some point during their manufacture. There is so much water in our everyday lives, it's very easy to just take it for granted. It is usually only once rains stop and fresh water supplies dry up or are polluted that we remember we can't afford to use water without thinking about how to ensure clean supplies for the future. To make sure everyone has enough, healthy water, 2013 has been chosen to be the International Year of Water Cooperation. So let us think about how to share this precious resource fairly and sustainably! There is enough water for all of us, but sometimes good planning is needed to make sure it's available where it's most needed.

TAKE this booklet and **EXPLORE, PLAY** and **DISCOVER** – and while you're having fun, maybe you can even come up with some clever ways to help preserve water in your homes. We hope you're fascinated by the things you learn about the greatest natural resource our world has to offer. After all: **YOUR** actions and ideas to save water today will help the world thrive and grow tomorrow! Water is refreshing and life-giving –

LET'S CELEBRATE IT!

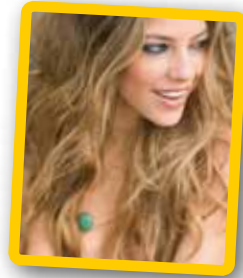
YUNGG
AMBA
SASSA
DORS



Anggun



Carl Lewis



Debi Nova



Fanny Lu



Lea Salonga



Nadeah



Noa (Achinoam Nini)



Percance



Valentina Vezzali

BE **SAFE** AND **SOUND!**

DEAR LEADER OR TEACHER,

The challenge badges are designed to support you in undertaking educational activities. However, as you will be implementing these activities in different contexts and environments, it is up to you to ensure that the activities you choose are appropriate and safe.

LOOK AFTER YOURSELF

- * Wash your hands after every activity.
- * Don't look directly at the sun.
- * Don't taste things you find unless you are certain they are not poisonous.
- * Don't drink water from natural sources unless you are sure it is safe.
- * Be particularly careful when you're near water (especially non-swimmers). Make sure there is a lifebelt to hand if you are near deeper waters.
- * Be careful when using sharp objects and electrical appliances. Young children should be supervised by an adult at all times.
- * In some activities, you have the option of uploading pictures or videos to the internet on websites such as YouTube. Always make sure that everyone in the pictures or video, and/or their parents, have given their permission before you post anything online.



Exploring the great outdoors is a fantastic way to learn about the natural world; nevertheless, it is important to take some precautions to ensure nobody gets hurt. Please plan carefully and make sure you have enough adult support to keep participants safe, especially when near water. Please consider the general precautions in the boxes below and carefully evaluate which other safety issues need to be taken into consideration before undertaking any activity.

LOOK AFTER THE NATURAL WORLD

- * Treat nature with respect.
- * It is better to leave nature as you found it. Never pick protected species. Before collecting plants or picking flowers, get permission. Only take what you really need and make sure you leave at least one third of anything you find in the wild.
- * Be careful if you are working with animals. Wear protection if necessary. Be gentle. Make sure they have appropriate food, water, shelter and air. When you're done, return them to where you found them.
- * Recycle or reuse the materials used in the activities as much as possible.

THE UNITED NATIONS CHALLENGE BADGE SERIES

Developed in collaboration with United Nations agencies, civil society and other organizations, the United Nations challenge badges are intended to raise awareness, educate and motivate young people to change their behaviour and be active agents of change in their local communities. The challenge badge series can be used by teachers in school classes and by youth leaders, and especially Guide or Scout groups.

To see existing badges go to www.yunga.org. To receive updates on new releases and other YUNGA news, register for the free YUNGA newsletter by emailing yunga@fao.org.



YUNGA has or is currently developing badges on the following topics:

AGRICULTURE: How can we grow food in a sustainable way?

BIODIVERSITY: Let's make sure no more of the world's glorious animals and plants disappear!

CLIMATE CHANGE: Join the fight against climate change and for a food secure future!

ENERGY: The world needs a healthy environment as well as electricity – how can we have both?

FORESTS: Forests provide homes for millions of plant and animal species, help regulate the atmosphere and provide us with essential resources. Let's protect them!

HUNGER: Having enough to eat is a basic human right. What can we do to help the 1 billion people who still go hungry every day?

NUTRITION: What is a healthy diet and how can we make food choices which are environmentally friendly?

THE OCEAN: The ocean is mesmerizing and amazing. It helps regulate temperatures on Earth, provides us with resources and much, much more.

SOILS: Without good soil, nothing grows. How can we take care of the ground under our feet?



CREATING

BEHAVIOUR CHANGE

We work with young people because we want to support them in leading fulfilling lives, help them prepare for their futures, and for them to believe that they can make a difference in the world. The best way to make this difference is by encouraging young people to embrace long-term behaviour change. Many current social and environmental problems are caused by unhealthy or unsustainable human behaviour. Most people need to adapt their behaviour, and not just for the duration of a project such as working on this badge, but for life. Young people know more about these issues than ever before, but still behave in detrimental ways. It is clear that simply raising awareness is not enough to change behaviour.

So what can you do?

There are some proven ways of promoting behaviour change, so to increase the long-term impact of this challenge badge, try to do the following:



FOCUS ON SPECIFIC, ACHIEVABLE BEHAVIOURAL CHANGE Prioritize activities which target very clear and specific behaviour change (e.g. 'turn off the tap when brushing your teeth' rather than 'save water').



ENCOURAGE ACTION PLANNING AND EMPOWERMENT Put young people in charge: let them choose their own activities and plan how to carry them out.



CHALLENGE CURRENT BEHAVIOUR AND TACKLE BARRIERS TO ACTION Encourage participants to scrutinize their current behaviour and think about how it could be changed. Everyone has excuses for why they don't behave in a particular way; lack of time, lack of money, not knowing what to do... the list goes on. Encourage young people to voice these excuses and then find ways around them.



PRACTISE ACTION SKILLS You'd like to take public transport more often? Collect and practise reading timetables, plot out routes on a map, take a walk to the bus stop, find out what the fare is, do a trial journey. You'd like to eat more healthily? Try lots of healthy foods to see which you like, experiment with recipes, learn how to read food labels, create meal planners, visit the shops to find healthy foods on their shelves. Keep practising until it becomes a habit.



SPEND TIME OUTDOORS No one is going to look after something they don't care about. Time spent in natural environments – whether that is the local park or a pristine wilderness – encourages an emotional connection with the natural world which is proven to lead to more pro-environmental behaviour.



GET FAMILIES AND COMMUNITIES INVOLVED Why change the behaviour of just one young person when you could change the behaviour of their entire family, or even the whole community? Spread your message more widely, encourage young people to pester their family or friends to join in and showcase what you have been doing for the local community. For an even bigger impact, get political and lobby your local or national government.



MAKE A PUBLIC COMMITMENT People are far more likely to do something if they agree to do it in front of witnesses or in a written statement – why not take advantage of this?



MONITOR CHANGE AND CELEBRATE SUCCESS Behaviour change is hard work! Revisit tasks regularly to monitor achievement and reward continued success in an appropriate way.



LEAD BY EXAMPLE The young people you work with look up to you. They respect you, care about what you think and want to make you proud. If you want them to embrace the behaviour you are advocating, then you must lead by example and make those changes yourself.

TIPS ON UNDERTAKING

THE BADGE WITH YOUR GROUP



In addition to the suggestions above encouraging behavioural change, the following ideas are intended to help you develop a programme to undertake the challenge badge with your group.

STEP 1

Encourage your group to learn about water, its importance in the world and its connection to poverty. You may find the background information is useful for this. Start by raising participants' awareness about our dependence on water beyond drinking, i.e. for food, sanitation, industry and ecosystems. Make sure they understand that water is a renewable, but finite resource and that human activity is causing water scarcity in different parts of the world. Explain how water shortage affects all aspects of people's lives and how this impacts development in general. Then discuss with the group how our individual choices and actions can help make a positive difference.

STEP 2

Apart from the compulsory activities, which ensure that participants understand basic concepts and issues related to water, participants are encouraged to select the activities that best match their needs, interests and culture. As far as possible, let the participants choose which activities they want to do. Some activities can be done individually, others in small groups. If you have another activity that is especially appropriate for your group or area, you may also include it as an additional option.

STEP 3

Allow enough time for the group to carry out the activities. Support and guide them through the process but make sure they carry out their tasks as independently as possible. Many activities can be conducted in several different ways. Encourage participants to think and act creatively when undertaking their activities.

STEP 4

Have participants present the results of their challenge badge activities to the rest of the group. Do you notice any changes in their attitudes and behaviour? Encourage participants to think about how their daily activities both depend upon and affect water. Discuss the experience and reflect on how they can continue to apply it in their lives.

STEP 5

Organize a celebration for those who successfully complete the badge curriculum. Invite families, friends, teachers, journalists and community leaders to participate in the celebration. Encourage your group to present the results of their project to the community in a creative way. Award them with certificates and challenge badges (see page 82 for details).

STEP 6 SHARE WITH YUNGA!

Send us your stories, photos, drawings, ideas and suggestions. We are always delighted to hear how you have been using these challenge badges and we always want to improve our resources, so contact us at: yunga@fao.org.

INTRODUCTION TO THE

WATER CHALLENGE BADGE



The water challenge badge is designed to help educate children and young people about the crucial role water plays for life on our planet.

This booklet includes basic **background information** on water, the water cycle and how water sustains life, as well as outlining why humans need clean water and sanitation to stay healthy. The badge looks at the different factors which affect our water supply (such as over-use, pollution, natural hazards and climate change) and considers how water can be conserved and used more efficiently. Naturally, some of this material will be more appropriate for certain ages than others. Leaders should select the topics and level of detail most appropriate for their group. For example, you may wish to skip the more complicated issues with younger groups, but you will probably wish to conduct further research beyond the badge with older groups.

The second part of the booklet contains the **badge curriculum**: a range of activities and ideas to stimulate learning and motivate children and young people to save water and engage in efforts to increase equitable access to clean water.

Additional resources, useful websites and a glossary explaining key terms (which are highlighted in the text like **this**) are also provided at the end of the booklet.

BADGE CONTENT AND CURRICULUM

This booklet is designed to help you develop an educational programme for your class or group on water issues.

However, teachers and youth leaders should use their own judgement to develop an appropriate curriculum for their group. This could incorporate additional activities not listed in this booklet, but which allow you to achieve all the educational requirements. Remember the key objective of the challenge badge is to educate, inspire and most of all motivate action and behaviour change.

Badge structure

The background information (pp.24-55) and the activities (pp.56-81) are divided into five main sections:

- A. WATER IS LIFE:** this section introduces basic facts about water and its importance to life on earth.
- B. USING WATER:** looks at how much water we use in our daily lives – from sanitation and health to the production of the food and goods we use every day.
- C. WATER AT RISK:** discusses the many ways in which unsafe or insufficient water supplies negatively impact life on earth.
- D. WATER FOR A BETTER WORLD:** explores the connection between water and development, considering human rights, health and conflict.
- E. TAKE ACTION:** suggests ideas to motivate and help your group or class undertake water-related initiatives within your local communities.

Requirements: To earn the badge, participants must complete one of the two compulsory activities presented at the beginning of each section, plus (at least) one additional activity from each section, chosen individually or as a group (see graphic below). Participants can also complete additional activities considered appropriate by the teacher or leader.

Section A: WATER IS LIFE

1 compulsory activity (A.1 or A.2) & at least 1 optional activity (A.3 - A.23)



Section B: USING WATER

1 compulsory activity (B.1 or B.2) & at least 1 optional activity (B.3 - B.12)



Section C: WATER AT RISK

1 compulsory activity (C.1 or C.2) & at least 1 optional activity (C.3 - C.9)



Section D: WATER FOR A BETTER WORLD

1 compulsory activity (D.1 or D.2) & at least 1 optional activity (D.3 - D.11)



Section E: TAKE ACTION

1 compulsory activity (E.1 or E.2) & at least 1 optional activity (E.3 - E.9)



**Water Challenge Badge
COMPLETED!**

Age ranges of activities

To help you and your group select the most appropriate activities, a coding system is provided to indicate the age group(s) for which each activity is most suitable. Next to each activity, a code (for example 'Levels ① and ②') indicates that the activity should be suitable for five to ten year olds and eleven to fifteen year olds. Please note that this coding is only indicative. You may find that an activity listed at one level is suitable for another age group in your particular location.

L
E
V
E
L

- ① Five to Ten years old
- ② Eleven to Fifteen years old
- ③ Sixteen plus years old

REMEMBER!

In addition to learning and skills-building, the badge activities should be **fun**. Encourage participants to enjoy the process of earning the badge and have fun while learning about water and its importance. The ultimate objectives of the badge are to stimulate interest in water issues, motivate individuals to change their behaviour and create local and international action.

SAMPLE BADGE

CURRICULA

The sample curricula for the different age groups below provide examples of how the badge could be earned and are intended to help you in developing your own programme.

LEVEL

1

Five to Ten years old

2

Eleven to Fifteen years old

3

Sixteen plus years old

Each activity has a specific learning aim, but in addition to this, children will also have the opportunity to learn more general skills including:

- * **TEAMWORK**
- * **IMAGINATION AND CREATIVITY**
- * **OBSERVATION SKILLS**
- * **CULTURAL AND ENVIRONMENTAL AWARENESS**
- * **NUMERICAL AND LITERACY SKILLS**

SECTION	ACTIVITY	LEARNING OBJECTIVE
A: Water is life	A.2: Where is Your Water from? (p.57)	To learn about the local water supply.
	A.3: Making a Splash (p.58)	To observe the water cycle in action and life around a puddle.
B: Using water	B.1: Watch Your Water (p.65)	To observe how much water we use at home and to develop strategies to reduce this.
	B.6: Water Power (p.66)	To explore how water can be used as a source of energy.
C: Water at risk	C.2: Water Filter (p.71)	To encourage a scientific style of thinking through play.
	C.4: Painted Pressures (p.72)	To raise awareness about water pressures collaboratively and creatively.
D: Water for a better world	D.2: Wild Ideas (p.75)	To exercise productive creativity.
	D.4: Rockin' the Boat (p.76)	To articulate important ideas in an imaginative, positive way and share this with a wider audience.
E: Take action	E.1: Spread the Word (p.79)	To motivate activism for sustainable water use among family and friends.
	E.4: Build a Well (p.80)	To do something to help others who are in need.

LEVEL

1

Five to Ten years old

2

Eleven to Fifteen years old

3

Sixteen plus years old

As in Level 1, each activity in Level 2 has a specific learning aim, but also fosters additional, more general skills including:

- * **TEAMWORK AND INDEPENDENT STUDY SKILLS**
- * **IMAGINATION AND CREATIVITY**
- * **OBSERVATION SKILLS**
- * **CULTURAL AND ENVIRONMENTAL AWARENESS**
- * **NUMERICAL AND LITERACY SKILLS**
- * **RESEARCH SKILLS**
- * **PRESENTATION AND PUBLIC SPEAKING SKILLS**
- * **THE ABILITY TO PRESENT AN ARGUMENT AND DEBATE**

SECTION	ACTIVITY	LEARNING OBJECTIVE
A: Water is life	A.1: We All Love Water (p.57)	To learn about local water systems and water supplies.
	A.18: Swimming Scientists (p.62)	To motivate scientific observation and thinking.
B: Using water	B.1: Watch Your Water (p.65)	To observe how much water we use at home and to develop strategies to reduce this.
	B.8: International Recipe Exchange (p.67)	To understand food's water use while exploring the eating habits of other cultures.
C: Water at risk	C.2: Water Filter (p.71)	To encourage a scientific style of thinking through play.
	C.7: Climate Change (p.73)	To understand the effects of climate change on world water supplies.
D: Water for a better world	D.2: Wild Ideas (p.75)	To exercise productive creativity.
	D.9: Water as a Human Right (p.77)	To learn about the importance of human rights.
E: Take action	E.2: Cleaning Time (p.79)	To take action against water pollution.
	E.8: Blog It! (p.81)	To communicate water issues to the world using social media.

LEVEL

1

Five to Ten years old

2

Eleven to Fifteen years old

3

Sixteen plus years old

General skills a Level 3 curriculum seeks to develop include:

- * **TEAMWORK AND INDEPENDENT STUDY**
- * **IMAGINATION AND CREATIVITY**
- * **OBSERVATION SKILLS**
- * **CULTURAL AND ENVIRONMENTAL AWARENESS**
- * **TECHNICAL SKILLS AND THE ABILITY TO RESEARCH COMPLEX ISSUES**
- * **PRESENTATION AND PUBLIC SPEAKING SKILLS**
- * **THE ABILITY TO PRESENT AN ARGUMENT AND DEBATE**

SECTION	ACTIVITY	LEARNING OBJECTIVE
A: Water is life	A.1: We All Love Water (p.57)	To learn about local water systems and water supplies.
	A.19: Cultural Crash Course (p.62)	To develop understanding and sensitivity for different cultures.
B: Using water	B.2: H₂O is hard to forego (p.65)	To become aware of how crucial water is in everyday life by first-hand experience.
	B.10: Doing the Math (p.68)	To reach a well-informed understanding of water consumption in daily life.
C: Water at risk	C.1: How Thirsty is Your Country? (p.71)	To understand the stresses and problems national water supplies face.
	C.5: Bring out the Bard in You (p.72)	To stimulate creative conflict-solving.
D: Water for a better world	D.1: Aqua Around the World (p.75)	To learn about global water usage.
	D.10: Water Pricing (p.77)	To be able to make eloquent and well-informed arguments about water access.
E: Take action	E.1: Spread the Word (p.79)	To motivate activism for sustainable water use among family and friends.
	E.6: Bottle Weaning (p.81)	To initiate and carry through a campaign for sustainable water use within the community.

BACKGROUND

INFORMATION

The following section provides an overview of the key issues related to water. It is intended to help teachers and youth leaders prepare their sessions and group activities without having to search for the information.

Naturally, not all the materials will be required for all age groups and activities. Equally, you may find you need additional information or resources for the older participants. You may want to allow older children to read the material themselves.



MATTAKARN LIMPHAIBOOL, aged 15, THAILAND

HYUN SOO CHO, aged 10, KOREA



A WATER IS LIFE

The source of life
The water cycle
Earth's water resources

B USING WATER

C WATER AT RISK

D WATER FOR A BETTER WORLD

Water and development
Saving water

E TAKE ACTION

LIFE

A

USING

B

RISK

C

WORLD

D

ACTION

E



WATER IS LIFE

THE SOURCE OF LIFE

Over 4 billion years ago, life started in water. The first living things (**‘organisms’**) were miniscule, made up of only one **cell** each. Over many, many millennia, these organisms became bigger and more complex, slowly becoming more like the animals and plants we know today. The first animals to leave the waters belong to the group called **amphibians**. You’ve probably come across modern amphibians, like frogs, salamanders or newts. Amphibians were originally fish, but fish with especially strong fins that allowed them to pull themselves out of the water and move on land. Unlike ordinary fish, amphibians evolved (developed) the ability to breathe air. However, like fish, most amphibians still have to go back into the water to lay their eggs. From then on, different kinds of animals continued to evolve, on land as well as in water, into the millions of amazing animals which surround us today.

Without water, earth would be lifeless. All life on our planet depends on water, from tough desert cacti to sticky snails to humans: none of us could survive without it. Water makes up the majority of all living organisms. **Did you know that the human body is around 60 percent water?** Our brains are 70 percent water and our lungs nearly 90 percent! Water plays an essential part in digesting food, it helps maintain our muscles, it helps carry oxygen and nutrients to our cells, it cools us down and it helps our bodies get rid of waste. No wonder we need water to keep us going! Just like humans and other animals, plants rely on water to transport **nutrients** to their cells, but plants also use water to produce their energy from the sun and to generate the oxygen we breathe.

WHAT IS WATER MADE OF?

If you know a little bit about chemistry, you might already know that everything is made up of tiny particles called '**atoms**'. These are like very small 'building blocks' which when put together form small clusters called '**molecules**'. A water molecule, for example, is made up of two hydrogen (H) atoms and one oxygen (O) atom (see the diagram). This is why the scientific name for water is **H₂O**. You probably already know oxygen very well: we need to breathe in the oxygen molecules floating around in the air to survive. The oxygen molecules we breathe in are made up of two oxygen atoms (O₂). Even though water contains oxygen, we can't breathe it when it's combined with hydrogen (although fish can!). So you see, different atom combinations end up making very different kinds of substances!

WATER MOLECULE

H

O

H



SHARAYU RAJENDRA NAR, aged 15, INDIA



Water in habitats

The surroundings and communities in which animals and plants live are called '**ecosystems**'. They can be as small as a puddle, as big as a forest, or even the whole world. In any ecosystem, different kinds of plants and animals live together. **Natural resources** (things which are not alive like water, air, soil and rocks) are also important parts of these ecosystems. Everyone and everything in these communities directly or indirectly relies on all the other parts of the group to survive (e.g. for food, drink or shelter). That's why it's so important that we take good care of nature: so that the world's ecosystems can keep working properly.

Within an ecosystem, different **organisms** have particular 'homes' (known as their '**habitat**'). Frozen water, the salty ocean and **fresh water** lakes are all examples of water habitats. The plants and animals living in these 'homes' are very different from each other! Perhaps you could investigate some of the differences between animals from different water habitats?



PATRICIA P. SAN LUIS, aged 15, PHILIPPINES



NETHMINI ASHINSANA WATTETENNA, aged 9, SRI LANKA

Water also influences these ‘homes’ on dry land. Over the millennia, glaciers (big bodies of ice), the ocean and rivers have cut valleys and shaped coastlines and plains. The features of a landscape affect the kind of organisms that can live there. Natural water processes like rainfall patterns or seasonal river **flooding** also affect life on earth. For example, the soil on floodplains is rich and good for growing plants which is important for the plants themselves as well as for the animals that eat them (including humans!). Water really is everywhere!



AISHA ALI SALEEM, aged 8, MALDIVES



Water and humans

Having explored water in the world at large, let's think a little more about how we humans use water in our everyday lives. Obviously we need to drink, but without water, we would have no food either. For example, all the crops farmers grow – like wheat, rice or fruit and vegetables – need water. The animals we keep to produce meat, eggs or milk all need to eat plants (which, as you know, have already consumed water) and drink water themselves, too. Just think, the one potato you ate last night for dinner took 25 litres of water to grow. And for those of you who are hamburger fans, did you know your favourite food “drank” 2 400 litres of water while being produced? **Surprisingly, it takes 1 000 times more water to feed the human population than it does to satisfy its thirst!**

Commodity	Water needed to produce (litres)
1 hamburger	2400
1 glass of milk	200
1 egg	135
1 apple	70
1 slice of bread	40
1 potato	25

Source: FAO



For this and other posters and graphics go to:
www.fao.org/nr/water/promotional.html

Water's role in our everyday lives goes further than just drinking and producing food. To start with, we use it for cooking and **sanitation** (washing and going to the toilet). In reality, water plays an unseen role in almost every aspect of our lives. Your favourite cotton t-shirt couldn't have been made without water: first the cotton plants needed water to grow, and then a lot more water was used to process the raw cotton into threads that could be woven together and even dyeing your t-shirt different colours also uses water. Similarly, a lot of water went into the manufacture of your phone, computer and TV and so on. In Section B, we'll look at human water use in more detail.

Not everyone has water

If all you have to do is turn on a tap when you feel like a refreshing drink, it's easy to take water for granted. But for almost 1 billion people on earth it's not so simple. They don't have access to safe drinking water. Many have to walk miles each day to collect water, or pay high prices for it. Often, this water is unclean and harmful (because it is contaminated with chemicals or **pathogens** which can make you ill). Nearly one in three people (that is 2.5 billion people) live in areas without proper, hygienic sanitation which leads to people catching diseases such as dysentery and cholera.

Not having access to clean water and sanitation has negative effects on people's health, their ability to learn and earn a living, and ultimately, a country's economy. You can find out more about the relationship between access to water and poverty in Section D.



BUNICA ANDREEA, aged 13, ROMANIA



THE WATER CYCLE

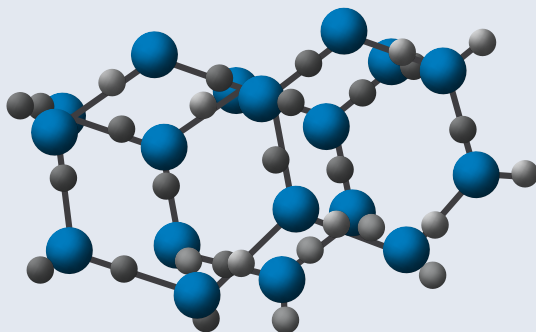
If we use water for so many things, how come we haven't run out? The answer is that water is a **renewable resource**. Today we have roughly the same amount of water on earth as we did when our planet was formed. Thanks to a process called the **water cycle**, this supply of water gets reused over and over again. Some of that same refreshing water you just drank might have quenched the thirst of a Tyrannosaurus Rex millions of years ago!

This is how it works: the sun's heat **evaporates** the water in rivers, lakes, the ocean, and ponds, turning it into vapour (moist air). These vapours rise up and when they reach cooler layers of the atmosphere, they form tiny droplets in a process called **condensation**. Clouds are large collections of these very tiny droplets of water, and in some cases, tiny crystals of ice. Another way that water enters the atmosphere is through **transpiration**, where water vapour is released from plants, or by animal **perspiration**. If you run very fast, or it's just a really hot day, you start sweating, don't you? That's because your body uses water as an automatic cooling system: by perspiring (sweating) through miniscule holes in your skin (**pores**), your body helps you cool down again. Isn't that clever?

As more and more water vapour collects in clouds, they get heavier and heavier until the air can't hold them anymore. The water then falls back to the earth in the form of rain, snow, hail or sleet depending on conditions in the atmosphere (e.g. how cold it is). This process is called **precipitation**. The water released by clouds ends up in the ocean, lakes, and rivers, or it falls on land. Water that falls on land either soaks into the earth to become part of earth's "**groundwater**" – the world's biggest storehouse of drinkable water – or becomes **run-off** (water running over the land because the ground can't absorb any more), flowing up back into streams, rivers, and eventually the ocean. It can also accumulate as snow and ice (glaciers) on mountains and at the North and South poles. And then the cycle starts all over again!

WHY DOES WATER TURN INTO ICE?

Here's a little bit more chemistry for you: when it gets really cold (colder than 0 degrees Celsius or 32 degrees Fahrenheit), fresh water turns from a liquid to a solid – it freezes, becoming ice. Normally, water **molecules** are full of energy, bouncing around. But as they grow colder, they lose their energy, slow down and start linking up with each other. They become fixed in cool shapes that look a bit like this:



Ice has many fascinating properties. For example, because ice molecules are fixed in place, ice takes up about 9 percent more space than water. This means that ice is less **dense** than water, allowing it to float on top of water. Have you seen ice cubes floating in a cold drink? The ice cap at the North Pole is a bit like a huge ice cube floating on the ocean. Currently we have ice all year round at the North and South poles and in high mountains. For long periods of the Earth's history it was much colder than it is today, so much more of the land was covered in ice. During these 'ice ages', many animals became extinct. But it could have been worse – because ice floats, some life forms could survive in the liquid water underneath even though it was really cold. Isn't that amazing?



THE ATMOSPHERE



CONDENSATION

EVAPORATION

RUNOFF

THE OCEAN

The Water Cycle

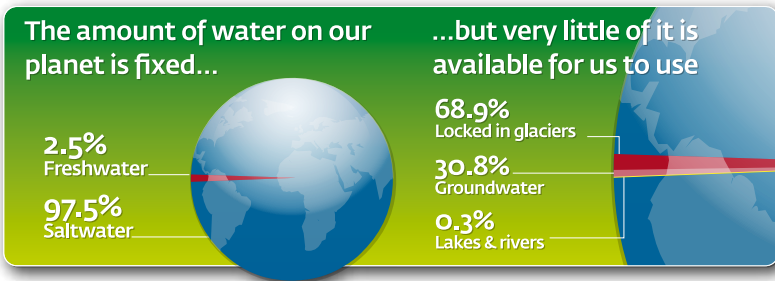
GROUNDWATER FLOW



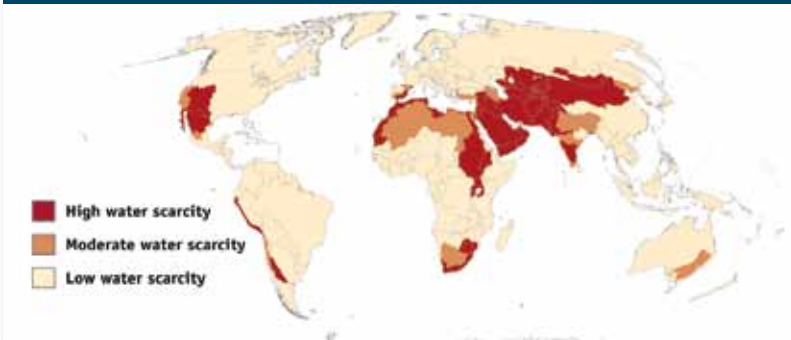


EARTH'S WATER RESOURCES

It might strike you as strange that **water scarcity** is a problem, considering there's so much water everywhere. In fact, some people even say our planet should have been named 'Water' instead of 'Earth'. Did you know that more than 70 percent of the Earth's surface is covered by water? But hold on – 97.5 percent of that is saltwater and therefore undrinkable. This leaves only 2.5 percent as drinkable **fresh water**. It gets worse. Almost 70 percent of that fresh water is frozen and trapped in the Antarctic, the Arctic and glaciers, and not available to humans. This means that less than one percent of the world's fresh water is available for humans and other inhabitants of the earth.

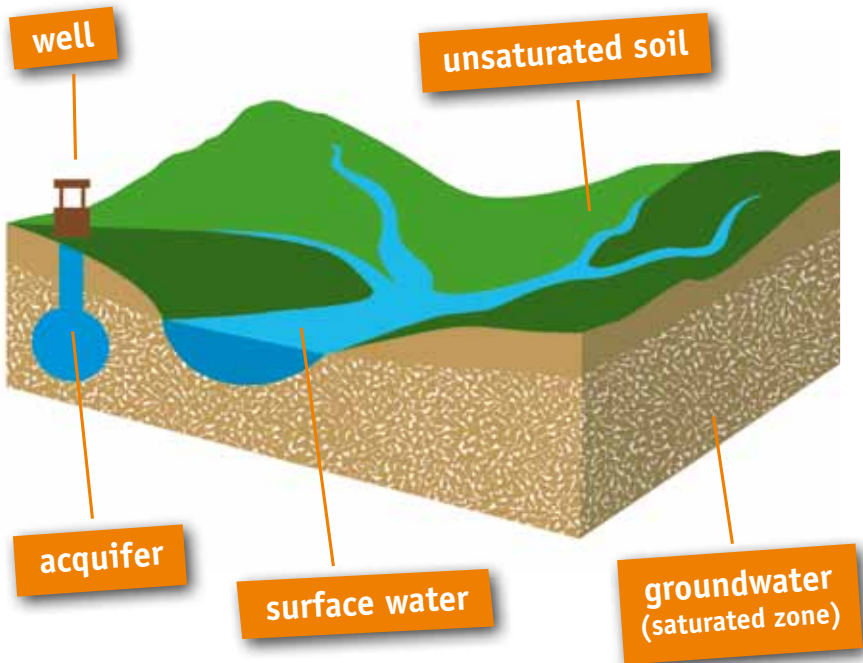


GLOBAL WATER SCARCITY BY RIVER BASIN



Sources of fresh water

Drinkable water, or **fresh water**, comes from surface water and **groundwater**, with groundwater providing 99 percent of all water usable by humans. Surface water includes rivers, lakes, and reservoirs. Groundwater comes from rain, snow, sleet and hail that has soaked into the ground and is now stored in the soil and between rocks beneath the Earth's surface. The area that becomes filled with water is known as the **saturated zone** and the part closest to the surface is called the **water table**. The water table can be near the ground's surface or hundreds of feet below it. An area where a lot of water is stored (which could for example be pumped up with a well) is called an **aquifer**.





USING WATER

HOW WE ACCESS FRESH WATER

Over the centuries, humans have devised a variety of ingenious methods of tapping into the water supply.

- ✱ **Aqueduct:** An **aqueduct** is a channel or pipe that transports water from a far-off source to a town, city, or agricultural area. The ancient Romans were famous for their aqueducts, which ran on high arches, along the ground in stone channels or through underground tunnels to bring **fresh water** to people in cities.
- ✱ **Well:** Wells collect **groundwater**. However, wells (especially shallow ones) are not always reliable sources of water because they can become contaminated by **run-off** in the rainy seasons or dry up in the dry seasons.
- ✱ **Borehole and electric pump:** A borehole is a very deep well drilled into the ground using special machinery. Boreholes are used when the water is a long way below the surface or when the ground is too hard to dig a well by conventional means. As they are so deep, an electric pump is needed to bring water to the surface.
- ✱ **Standpost:** A standpost is an outside tap where a number of households can go to get water. Public standposts are connected to the public water distribution system and controlled by a public water company, while private standposts are not.
- ✱ **House connection:** Piped water from the public water distribution system that reaches the home or yard. When people have house connections, they usually have indoor plumbing as well; if they have yard taps, they have to go outside to get water.

Source: Youthink!

So what are we using all this water for, anyway?
Let's take a closer look at the main uses of water.

AGRICULTURE

Globally, around 70 percent of water is used for agriculture. The amount of water used varies from place to place and depends on factors such as the type of food being produced, local climate conditions (the temperature and how often it rains) and the **irrigation** systems used. For example, in England where it rains a lot all year, less than 1 percent of water used by humans goes into agriculture. Yet even in the same continent, water used for irrigation in Spain, Portugal and Greece exceeds 70 percent of total usage (*Source: WBCSD*). Different types of food require vastly different amounts of water to be produced. For example, in many European and American grocery stores, a typical egg requires about 135 litres of water to produce, while a kilo of grain takes on average 1 500 litres and a kilo of grain-fed beef approximately 15 000 litres! This means that one really important way we can use water sustainably is by eating less water-intensive foods. This will free up more water for people to drink and grow essential foods.

HOW MUCH WATER IS NEEDED TO PRODUCE...

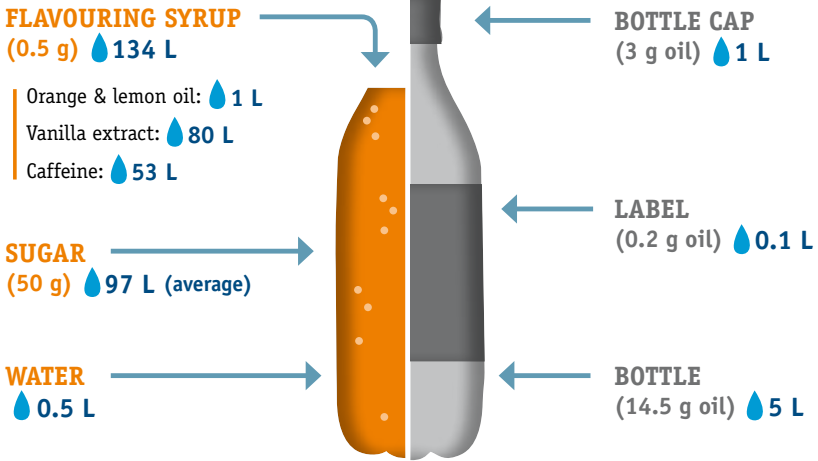


To produce enough food to satisfy a person's daily needs takes about 3000 litres of water.

Source: FAO



WATER USE IN A FIZZY DRINK



TOTAL WATER USE: 💧 237.6 L



The road continues, depending on how the bottle will be transported and where it will be sold...

INDUSTRY AND ENERGY

After agriculture, industry is the second largest user of water, accounting for 22 percent of global usage. Water is used for many industrial purposes, such as cooling, cleaning, heating, generating steam, and transporting dissolved substances or particles. In addition, water is an essential part of many products (like drinks, cosmetics or medicines). While the volume of water for industrial use is relatively low overall, industry affects water availability through pollution. A lot of **industrial waste** is discharged into open water sources, harming the quality of large volumes of water. Today, a lot of work is being done to improve industrial practices to protect the

environment and use water more efficiently, so they make the most of the water available to them and waste as little as possible. Water also plays a key role in producing energy. Did you know that fossil fuel and nuclear power stations generate electricity by turning water to steam? The high-pressure steam is used to turn large **turbines** which then generate electricity. A more environmentally-friendly way of producing energy using water is **hydropower**. Avoiding polluting or dangerous fuels, hydropower uses the flow of water in rivers or dams to turn turbines to generate electricity. Using the power of water is not new – in old-fashioned water mills, water-wheels turned the millstone to grind flour. Today, hydropower provides about 20 percent of the world’s electricity. However, building dams can also create problems for the animals and plants that usually live in the area. Can you think why this might be?

DOMESTIC USE

Imagine if your home water supply gets cut off for a day. While it might get you out of washing the dishes, it will probably inconvenience you in lots of other ways. Think about the number of ways in which you use water at home. You’ll probably come up with quite a long list! There’s water for drinking, of course: humans need a minimum of 2 litres of drinking water per day to survive. In addition, we need water for cooking, cleaning, washing and sanitation. Globally, domestic use accounts for 8 percent of the water used by humans.

HAVE YOU GOT WATER?

3.8 billion people, around 57 percent of the world’s population, have access to running water in their homes or compound, according to a 2010 World Health Organization report.

This means the other 43 percent don’t!



WATER AT RISK

SO WHAT'S THE PROBLEM?

Even if only a small proportion of the Earth's water is **fresh water**, it's renewable, right? It gets recycled over and over thanks to the water cycle. So why all the fuss?

The problem is human activity, which is interfering with the **water cycle** through over-consumption and pollution. Too much water is wasted and contaminated. Because of human activity, rivers and **groundwater** supplies have dried up in many areas. Moreover, water is not evenly distributed around the world, so some areas have more than they need, and others have too little.

As mentioned in the section on the **water cycle**, a large part of the water that falls on land in the form of rain, hail or snow becomes '**run-off**', flowing back into streams, rivers, and lakes, or builds up as snow cover and glaciers. Run-off is a very important part of people's water supply, but unfortunately the amount of run-off varies hugely from region to region and at different times of the year. For example, Asia has more than 60 percent of the world population but only 36 percent of river run-off, while South America has just 6 percent of the global population, but 26 percent of run-off! Canada has over 30 times more water available to each of its citizens than China. (Source: <http://atlas.aaas.org/pdf/51-54.pdf>.)

So yes, although water is a **renewable resource** and the world will not run out of water entirely, many regions around the world face a serious shortage of clean and safe fresh water.

WATER SCARCITY

Today around 700 million people in 43 countries suffer from a lack of water (this is called water scarcity). People suffer from water scarcity either because there is a general lack of fresh water in their area, or because they do not have the right technologies or enough money to access it. By 2025, 1.8 billion people (23 percent of the total expected population) will be living in countries or regions with absolute water scarcity, and two-thirds of the world's population (another 3.4 billion people) could be living under water stressed conditions.

Let's take a closer look at some of the major causes of insufficient and unsafe water.

Population

The factors placing the greatest pressure on water are population growth and the increased consumption resulting from higher average incomes per person. Just 50 years ago we had half as many people on the planet as we do today. They had less money to spend on goods or leisure activities that use up water, and ate less meat and other water-intensive foods. Now we use three times more water per person than they did.

Urbanization

For the first time in human history, the majority of the world's population lives in cities. This rapid urbanization is placing further pressure on water supply. Today, 3.3 billion people live in cities. What's more, our cities are still growing... 93 percent of urbanization is happening in developing countries and nearly 40 percent of that urban growth is happening in slums. As you can imagine, there are many challenges in accommodating these increased populations. So far, infrastructure has not been able to keep up. The main problems associated with this are managing



water supplies and sanitation. More than a quarter of the urban population in developing countries does not have piped water at home. These urban poor end up paying the highest prices for water, since they often have to buy from private vendors: a slum dweller in Nairobi pays 5 to 7 times as much for a litre of water than the average North American (Source: UN). In terms of **sanitation**, 794 million city dwellers lack clean, functioning toilets. Waste often ends up contaminating water supplies, leading to the spread of diseases like cholera and **malaria**.

WATER QUALITY

ONE IN SIX PEOPLE
WORLDWIDE DOESN'T HAVE
ACCESS TO CLEAN WATER

In developing countries,
→70%
of industrial wastes are
dumped untreated into
waters where they pollute
the usable water supply.

Every day, **2 million**
tons of sewage and
other effluents drain
into the world's
waters

Half of the
world's wetlands
have been lost
since 1900

UN WATER.ORG

Source: UN Water

Pollution and water quality

Water pollution poses a serious threat to public health, agriculture, industry, and **biodiversity**. Water quality worldwide is deteriorating mostly because of human activities.

- * **Sewage:** As mentioned, increasing population sizes and **urbanization** result in more sewage and wastewater being discharged into lakes and rivers. Every day, 2 million tons of human waste gets dumped in open water sources.
- * **Industry:** Chemicals, like those used in industry or agriculture, are also major culprits of water pollution. Water contaminated with these chemicals can cause diseases as serious as cancer, and destroy plant and animal life. The pulp and paper industry alone produces over 100 000 tons of toxic waste that ends up in fresh water sources each year (*Source: One Drop*).
- * **Oil pollution:** Oil spills and leakages from routine sea transportation take a heavy toll on the ocean, killing fish and marine birds and dirtying the water.
- * **Radioactive waste:** Waste from nuclear power plants or mining activity is also very harmful to rivers and marine ecosystems.
- * **Tourism:** Large hotels or leisure facilities usually require huge amounts of water, mainly for sanitation, swimming pools and **irrigation** (e.g. on golf courses). Tourists tend to use more water on holiday than at home, and particularly enjoy going to warm countries which are likely to have less water available. This can badly overstretch local fresh water supplies.



MA. MICHELLIN F. QUERIJERO, aged 16, PHILIPPINES



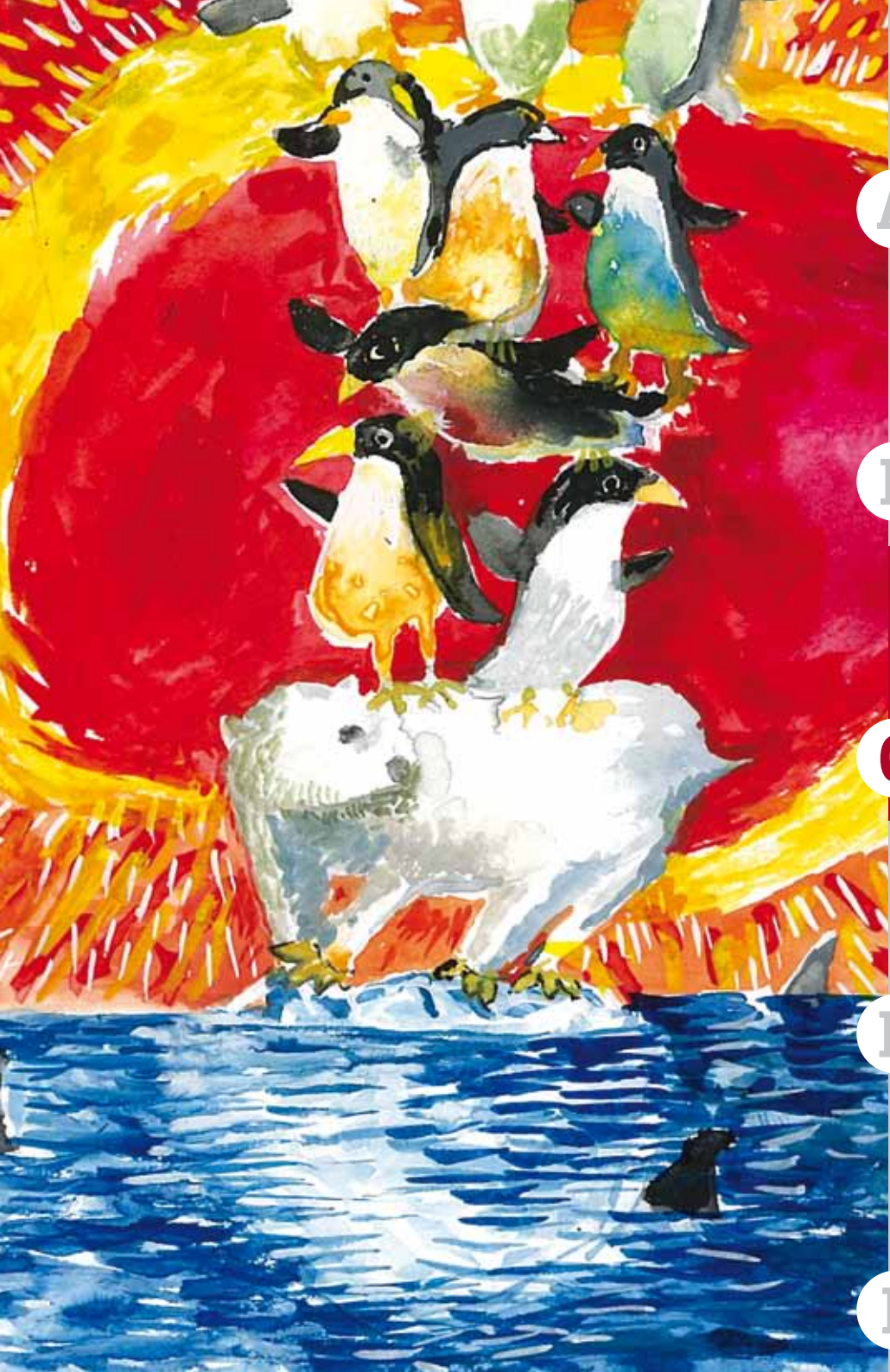
Climate change

The main impacts of climate change on humans and the environment occur through water. Many parts of the world are already facing more severe droughts and floods than before. As well as damaging homes, floods can also pollute local water supplies, resulting in less availability of safe, clean drinking water. Rising temperatures are causing glaciers and ice caps to melt, and this is expected to get increasingly worse. All this melting ice will run off the land and make sea levels rise. This puts low-lying countries at risk and will increase the salinity (saltiness) of groundwater sources.

Poor management

The world's water shortages are mostly a result of ineffective management. Governments, policy-makers and those in charge of managing water resources can do a lot toward improving the distribution of water and ensuring it is used wisely and sustainably. Unfortunately, this isn't always easy to organize, and can be quite expensive. For example, UNESCO (the United Nations Educational, Scientific and Cultural Organization) estimates that leaky pipes and aged systems in many cities lose half of the water they carry before it reaches its destination! UNESCO has also calculated that the total cost of replacing these kinds of old water supply and sanitation systems in industrial countries may be as high as 200 billion US dollars a year.

Other human activities such as deforestation and over-exploitation of natural resources could worsen floods and other natural hazards. All of this will have serious implications for urban and rural water supply, agriculture, energy, industry and the environment (Source: Youthink!). The livelihoods of women and girls are especially vulnerable to the effects of climate change, exacerbating the already vicious poverty cycle.



LIFE

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WATER FOR A BETTER WORLD

WATER AND DEVELOPMENT

Water affects so many aspects of our lives that it is impossible to win the fight against poverty unless everyone has access to safe water and basic **sanitation**. Unsafe water and poor sanitation cause diseases, which prevent people from earning a living or getting an education. This creates a cycle of poverty.

In the year 2000, the United Nations set itself eight targets aiming to reduce world poverty by half by 2015. They are called the **Millennium Development Goals**, and resolving the world's water issues is very important to achieving these goals. Goal 7 for example explicitly aims to halve the number of people without access to clean drinking water and basic sanitation.

The good news is that the world is on track to meeting the drinking water target – 1.7 billion people have gained access to safe drinking water since 1990! The not-so-good news is that half the world's population still lives without proper sanitation. So there is a lot of work still to do. You can read more about the other Millennium Development goals here: www.un.org/millenniumgoals

The Human Right to Water



Between
50 and 100
liters of water per person
per day are needed
to ensure most basic
needs (1)



The water source
has to be within
1,000
meters from home (1)



Water cost should
not exceed **3** per
cent of household
income (2)



Collection time
should not exceed
30 minutes (1)

UN-Water Decade Programme on Advocacy and Communication (UNW-OPAC)

Source: FAO

WATER AND CHILDREN

Children are most vulnerable to water-related diseases. According to the World Health Organisation (WHO), around 3 900 children die every day because of dirty water or poor hygiene. Lack of good sanitation also leads to stagnant, dirty water, which is a favourite hangout of mosquitoes. This can spread malaria, which kills one child every minute in Africa, and causes 22 percent of all childhood deaths.



WATER AND GIRLS

Due to traditional gender roles, unequal access to resources and limited mobility, women and girls in many countries are affected more severely by natural disasters including **floods** and **droughts** than men and boys. Did you know that in many countries, collecting water is a job typically done by women and girls? Many of them face a long and risky journey and the queues at the water source can be so long that they have to wait several hours for their turn. This means that girls often miss out on school while collecting water and women lose time they could be spending on other productive activities. Some girls also miss out if the school can't afford separate toilet facilities for boys and girls. Some cultures aren't comfortable with the idea of sharing facilities so the girls simply stay at home. However, as custodians of the land, girls and young women can play an important role in improving water management in their communities.

Transboundary waters

Transboundary waters are waters that are shared by two or more countries. More than 90 percent of the world's population lives in countries that share rivers and lakes. Our world's **groundwater** – which around 2 billion people depend upon – includes around 300 transboundary **aquifer** systems (Source: UN). These aquifers are important not just because they store good quality drinking water, but also because they support **ecosystems**, farming, industry and the livelihoods of hundreds of millions of people around the world. **Climate change** and overuse are threatening these water resources, which raises concerns about tension and conflict over them. On the other hand, there is a lot of room for co-operation, too. Effective co-operation can result in better management and more sustainable use of water resources, benefiting everyone in the long run. To this end, the UN has pronounced 2013 as the International Year of Water Co-operation.



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SAVING WATER

A lot of different techniques have been developed to increase or conserve (save and protect) water supplies. These include:

- * **Drip irrigation:** This is a watering method for crops, which conserves both water and fertilizer by enabling water to drip slowly to plant roots through a system of pipes and tubing. It has been used since ancient times and is useful for farms, greenhouses and even home gardens. Israel has been especially innovative in drip irrigation technology.
- * **Rainwater harvesting:** Collecting and storing rainwater is proving effective in very dry parts of the world. Rainwater can be saved to irrigate crops during dry spells, and can also provide water for drinking, domestic use and animal farming. More than 95 percent of farmland in Africa and almost 90 percent in Latin America depend on rainfall for water. Harvesting rainwater is cheap and allows individuals and communities to manage their own water. According to the UN Environment Programme (UNEP), rainwater harvesting can double food production, while simple irrigation can only increase production by 10 percent.
- * **Cleaning water:** There are lots of ways to treat dirty or contaminated water. Common methods include filtration (removing unwanted particles by pouring water through a filter), chlorination (adding chlorine, a chemical that kills bacteria), ozonation (adding ozone (O₃) to remove contaminants) and disinfection with ultraviolet light.
- * **Recycling water:** Water which is only a little bit dirty (e.g. that you've used to wash your hands or take a shower) is known as 'grey water'. 'Grey water' can sometimes be re-used, rather than sent directly down the drains, for example, to flush toilets or water gardens.

- ★ **Desalination:** This means removing salts from the ocean water to make it drinkable. Countries in the Middle East and North Africa are world leaders in desalination technology and generate 60 percent of the world's desalinated water. However, desalination requires a lot of energy.

Better management

Because water affects so many parts of our lives, it is very important to think about the many different ways in which water is used by different people and in different **ecosystems**. This kind of thinking helps us manage international water supplies well and is called 'Integrated Water Resources Management' (or IWRM for short). If people who need water for different purposes (e.g. farming, drinking, producing energy, providing **sanitation**) work together, it is easier to find the best ways of using water efficiently and avoiding disagreements about water supplies.



ONG CHI THING, aged 15, MALAYSIA



TAKE ACTION

The international community recognizes the urgent need to work together to manage water resources better. In July 2010, the United Nations General Assembly recognized safe, clean drinking water and [sanitation](#) as a [human right](#) essential to achieving all other human rights. The United Nations also proclaimed 2005-2015 the International Decade for Action Water for Life. By promoting international efforts, the United Nations hopes to be able to establish international policies and activities that will ensure the long-term sustainable management of water resources.

YOU CAN MAKE THE DIFFERENCE

Everyone can make a difference. So get involved and help protect the planet's water resources! There's a lot to be done: we need to fight water pollution, overcome the problems of [water scarcity](#), help [developing countries](#), manage conflicting water interests and tackle [climate change](#)! Which of these issues make you want to stand up and take action? You can start by doing this Water Challenge Badge: turn to the activities section and get started! If you want to do more, you can get even more ideas from the initiatives listed below...

[Getting involved](#)

There are lots of global movements and projects which can help you get started on your water-saving mission. Also be sure to check out the web links at the end of this booklet (page 83).

LET'S DO SOMETHING FOR WATER!



UN International Decade for Action Water for Life, 2005-2015
www.un.org/waterforlifedecade/background.shtml



World Water Monitoring Day; a day to raise public awareness and involvement in protecting water resources
www.worldwatermonitoringday.org



Global Handwashing Day, held on October 15 each year www.globalhandwashingday.org



World Water Day, held on March 22 every year
www.unwater.org/worldwaterday



World Toilet Day, held on November 19 each year www.worldtoiletday.org



World Water Week, a meeting about the globe's water issues that takes place each year in Stockholm www.worldwaterweek.org



The World Water Forum, an annual global brainstorming on water
www.worldwaterforum6.org/en

SECTION A:

WATER IS LIFE

DO EITHER **A.1.** OR **A.2.** AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE.

AFTER COMPLETING OUR **WATER IS LIFE** ACTIVITIES, YOU WILL:

- * Be **FAMILIAR** with the water resources in your area.
- * **UNDERSTAND** the importance of water for life on Earth.

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

A.01 WE ALL LOVE WATER Visit a local forest, nature reserve, beach, farm, park or other outdoor area and

LEVEL

- 3** observe the way different species use water. You might
- 2** even want to visit a variety of places (ecosystems),
- 1** e.g. forest, beach, swamp, etc. You might observe that frogs and toads absorb water through their skin, while mosquitoes tend to congregate around stagnant water. Make notes and take pictures. Then, in your next session, discuss or create a poster to explain how each animal needs water and how water is important for the ecosystem as a whole.

A.02 WHERE IS YOUR WATER FROM? Find out where

LEVEL

- 3** your water comes from. Does it travel hundreds of miles,
- 2** or is it from nearby? Does your city rely on a lake or on
- 1** groundwater? Also find out about how your water is treated before and after you have used it. Compare with another town or country – are your findings similar, or different?

Some activities in this section require participants to go near ponds, lakes, beaches or other water bodies. Be sure to take water safety precautions and to do the activities under qualified supervision.





CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

A.03 MAKING A SPLASH Observe the puddles that form near your house after the rain. Do you notice any insects or other animals in or around them? What are they doing there?

LEVEL ●
●
①

Draw a picture of the life in and around the most interesting puddle. Also monitor your puddles and write down how long it takes for them to dry up. Do you know where the insects and animals have gone?

A.04 WATER CHARADES In a group, create a set of cards, each labelled with a water-related word, such as “sanitation”, “saline”, and “muddy”. Be as creative as possible! Then mix all the cards up and split up into teams. Play a game of charades, where each person has to act out the word on their card, while their team has to guess what they are.

LEVEL ●
●
①

A.05 BLIND MAN’S BLUFF Pin up a drawing of the human body on the wall of your class or meeting room. Then, in turns, wearing a blindfold, pick a part of the body with a pin, a pen or by pointing. Tell the group a story about water and that part of your body. How is water important for that body part? How have water and that bit of you come into contact? For example, when you’re sad, your eyes cry salty water! But when your eyes water, it also means they wash out dust. Or, if you picked a foot – when was the last time you got your feet soaked splashing in a puddle?

LEVEL ●
②
①

A.06 THE WATER CYCLE GAME Make a card for each step of the water cycle, e.g. “evaporation”, “condensation”, etc.

LEVEL 2 Under each word, make a drawing that shows what it is. Then mix up the cards and deal them randomly amongst your group. Each cardholder describes in turn their role in the water cycle. You can also conduct an experiment on the water cycle. Visit this website to learn how: thewaterproject.org/resources/lesson-plans/create-a-mini-water-cycle.php.

A.07 LINGUISTIC ADVENTURES Allocate each group member a different country (you can get a list at www.un.org/en/members). Then, individually, find out what the word for “water” is in that country’s main language. Come back together and share your findings. Have a contest to see who can remember the word for “water” in the most languages, and then come up with a fun tongue twister by mixing and matching the different words!

A.08 WATER DANCE In a group, watch the way water flows.

LEVEL 2 Talk about what you see; for example, it can be calm and beautiful, or really fast and exciting. Let yourself be inspired and choreograph a ‘water dance’ together, showing some of the different ways water moves. Perform it for your friends and family.





- A.09 WATERY VERSE** Write a limerick about water's use in agriculture, industry, or your home. If you don't know how to write a limerick, visit this website for the guidelines: www.poetry4kids.com/blog/lessons/how-to-write-a-limerick. Share your limericks with the class, and, if you want, make a poster of your limerick with an accompanying drawing, to put up in your classroom. Here is an example to kickstart your creativity:

*'There was once a rice field so vain,
It always showed off to the rain.
"I'm more important," it stated –
The rain laughed and abated
And the field never grew rice again.'*

- A.10 DELVE INTO DIRT** Observe the way soil wears down (erosion) by pouring water onto different kinds of soil (e.g. sand, earth, clay...). Compare a river (water from a jug) with a rain shower (water from a watering can). Experiment to find out whether some soils erode more easily than others. What do you think the long-term consequences of this would be?

- A.11 DRAWING WATER** Use the glossary at the end of this booklet to play a game of "Water Pictionary." Create two or more teams and split the words up amongst the teams. If you don't know the rules, you can find them at this website: www.group-games.com/ice-breakers/homemade-pictionary-game.html.

A.12 WATER COLOURS Who says water is always blue? Take
 LEVEL ● photographs of different kinds of water in different lights,
 LEVEL ② capturing the different colours and textures water can
 LEVEL ① have. Print your favourite pictures and hold a photography
 exhibition for your parents and friends.

A.13 MAGNIFYING GLASS Examine the life inside a stream or
 LEVEL ● pond. Take a water sample and examine it under a magnifying
 LEVEL ② glass or microscope. Afterwards, draw what you saw. Return
 LEVEL ① the water and creatures back to the stream or pond.

A.14 LITERARY WATERS Visit your school or local library and
 LEVEL ③ ask the librarian to recommend a novel in which water is an
 LEVEL ② important feature. For example, the Mississippi River (USA)
 LEVEL ① plays an important role in *The Adventures of Huckleberry Finn*
 and the Lake District (UK) is the setting for *Swallows and
 Amazons*. Write a book review focusing on water's importance
 or symbolism in the story.

A.15 SALTY STUDIES Dissolve plenty of salt in a glass of water.
 LEVEL ③ Then leave it in a warm place for a few days. What happens
 LEVEL ② and why? Research how salt can be separated from water
 LEVEL ① so that pure water is left behind. This process is known as
 "desalination".

A.16 THE FUTURE OF WATER
 LEVEL ③ Draw or build a model house or town of the future. How could
 LEVEL ② you adapt your home, garden or community to use water more
 LEVEL ① efficiently? Research and include existing technology or come
 up with your own invention!



A.17 WHERE'S THE WATER? Water is not distributed evenly on Earth. Draw a world map, or label an existing one, to show which countries in the world have the largest supply of the world's available **fresh water**. Are there big variations within those countries? Where and in what form is their water found? What could be done to increase access to safe drinking water?

LEVEL 3
LEVEL 2
●

A.18 SWIMMING SCIENTISTS If you can swim, get a pair of goggles or snorkelling equipment and go swimming (under adult supervision) in a safe river, lake or sea near you. Look out carefully for underwater life. Be careful if you decide to dive down! Afterwards, sketch what you saw.

LEVEL 3
LEVEL 2
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A.19 CULTURAL CRASH COURSE Water has a cultural significance that varies from place to place. For example, the Ganges River is sacred to many Indians. For Christians, baptism is an important rite that involves water. Split up into groups and pick a region to focus on. Then do some research to learn about water's significance in your region. Does it have an important role in the local culture or religion? Is it depicted in their art or celebrated in music? Come back together as a group and share your findings.

LEVEL 3
LEVEL 2
●



A.20 AQUATIC EXPLORATION Learn about your local **watershed** (an area of land that catches rain and snow, and drains into a larger body of water such as a marsh, stream, river, lake, the ocean or **groundwater**). Take photographs or draw pictures of it, and set up an exhibition with detailed captions explaining the interaction of plants, animals and water. Make sure you include the different inputs to the water,

LEVEL 3
LEVEL 2
●

including natural streams and runoff from farms or industrial areas. Invite your family, friends and teachers to view the exhibition and hold a question/answer session.

A.21 THE SCIENCE OF WATER

Water is perhaps the most intriguing **molecule** on our planet. It's the basis for life.

LEVEL 3 It exhibits different properties depending on its state - as liquid water, as solid ice or as gaseous water vapour. It shapes landscapes all around the earth. Investigate some interesting facts about the chemistry and physics of the water molecule, such as the **density** of liquid versus solid water, how pollutants and water molecules combine to form acid rain, or why water is the main component of most living species. How do a water molecule's unique traits (often called its 'properties') allow or prevent life? How do these properties affect landscapes? Share the five most interesting facts with your group.

A.22 HOME SWEET HOME

If you moved a typical salt water fish into a **fresh water** environment (or vice versa), it probably wouldn't live very long. That's because each species is specially adapted to its native **habitat**. For example, some seabirds "cry" salty tears to get rid of excess salt, and fresh water fish usually have very dilute urine (and they pee a lot). Do some research to learn about the special adaptations of species living in fresh water. Compare these adaptations to those of species living in salt water. Create a labelled poster comparing fresh and salt water species and their typical adaptations. You can also study other water-dwelling **organisms** and their adaptations, e.g. deep sea creatures, microbes (bugs) living in steam vents or in ice.

A.23 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

SECTION B:

USING WATER

DO EITHER **B.1.** OR **B.2.** AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING OUR **USING WATER** ACTIVITIES, YOU WILL BE ABLE TO:

- * **OBSERVE** how much water you use in your daily life.
- * **SUGGEST** ways to save water to your friends and family.

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

B.01 WATCH YOUR WATER Keep a diary of all the ways water is used on a daily basis in your home. Look for ways to reduce water usage. For instance, do your brothers and sisters or family members leave the water running while brushing their teeth? Or does someone take really long showers? Share water-saving tips with your family, and collect some facts to convince them. For example, taking a shorter shower can save up to around 568 litres of water per month! Also, prowling your house to check if any of your taps are leaking. Ask your parents to have them fixed. Did you know that an average leak can waste up to 7 570 litres per year? Conduct your own experiment on leaks by checking out this website: www.nsf.org/consumer/earth_day/earthday_experiment.asp. In addition, check out these water-saving ideas and try to implement them in your home: www.wateruseitwisely.com/100-ways-to-conserve/index.php. After one week, compare notes with your friends. What did you change at home? What did they manage to change? Who was the most successful? Make a pledge to keep up these changes for a month then review your efforts. Can you keep going for 6 months? A year? Forever?

B.02 H₂O IS HARD TO FOREGO Keep drinking so you don't feel unwell, but other than that, see if you can avoid using water for a whole day. How soon does this become inconvenient? Make a list of all the ways this disrupts your life. Think about the millions of people who face this situation on a daily basis. Prioritize the ways you use water – what would you be willing to cut back on or live without? Make a pledge to reduce your water use in one key area. Review your progress after a week. Renew your pledge – can you keep this up for a month? A year? Forever?



CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

B.03 KEEPING IT CLEAN Visit a local factory, farm or other kind of industry that uses a lot of water and find out what they do with **wastewater**. Is it treated and if so, how? Where is it discharged? Have their practices improved or changed over the years? In what way? If it was your business what changes would you make to use water more efficiently or to reduce pollution.

LEVEL
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1

B.04 THIRSTY FOODS Find out which foods take the most water to produce. How much water does it take to produce them? Compare them to foods that require less water to produce. Then monitor your eating habits for a week to discover which foods you eat more of. Compare results with your friends. Who is the most “water-friendly” eater? Make a pledge to change one thing to become a more water-friendly eater, e.g. eat less meat, and review your progress regularly.

LEVEL
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GOOD
IDEA

B.05 WATERWORKS Identify your local water supply company and learn about what kind of work they do. Arrange to go on a tour or talk to a member of staff, if possible.

LEVEL
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B.06 WATER POWER Make your own waterwheel to get an idea how **turbines** in energy stations work, and how old mills used water power to grind things like wheat. You can find instructions for how to build a waterwheel here:

LEVEL
3
2
1

www.uptoten.com/kids/coloringpage-mixedbag-craft-colorfulwatermillcraft.html



**GOOD
IDEA**

B.07 SHIPPING COMPANY Huge amounts of

- LEVEL 3** goods are shipped around the world down rivers
LEVEL 2 and across the ocean. Use different materials (wood,
LEVEL 1 paper, cardboard, plastic or aluminium) to make little boats
 and rafts. Test your 'boats' in a river, lake or at the beach.
 Which are the best materials to make your mini-boats from?
 Try attaching some fabric to a stick and making a sail. Does
 this make a difference? Load them up with 'goods' (like sticks
 and stones). How much weight can the different boats take?
 You can even hold a race to find out which boat is fastest.

B.08 INTERNATIONAL RECIPE EXCHANGE Write out the

- LEVEL 3** recipe of your favourite dish from your country (or work with
LEVEL 2 a parent to do so) and calculate how much water it contains;
LEVEL 1 not just in terms of adding water while cooking it, but also
 try to find out how much "hidden" water the individual
 ingredients contain too. Share your recipes with each other
 and check which ones contain the most and least amounts of
 water. Vote on one recipe to cook together as a group.

B.09 WHITHER WATER? Research your country's use of water for

- LEVEL 3** agriculture, industry, domestic use, energy and other areas.
LEVEL 2 What is the most water being used for? Where do you think
LEVEL 1 savings could be made?



B.10 DOING THE MATH Make a list of all the machines and appliances that use water in your home. Try to find out how much water they use. If possible, calculate how much water you can save at home by using more water-efficient appliances (by comparing older models of appliances to newer ones online for instance). Did you know that a low-flush toilet uses just 5.7 litres per flush, compared to 15.4 litres per flush for a traditional toilet? New washing machines use up to 40 percent less water per load than older machines, and they can save energy too. Present your findings (maybe in the form of a poster or Power Point presentation) to your group or class or create a leaflet to convince people why they should choose more water-efficient appliances.

B.11 THE WATER IN YOUR WARDROBE What are your favourite possessions? Your old, comfy jeans? Your laptop? Your phone? Make a list of your top 5 things and then do some research to discover how much water went into their creation. Are you surprised by the results? Compare your findings with others'.

B.12 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3



LIFE

A

USING

B

RISK

C

WORLD

D

ACTION

E

SECTION C:

WATER AT RISK

DO EITHER **C.1.** OR **C.2.** AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE.

AFTER COMPLETING OUR **WATER AT RISK** ACTIVITIES, YOU WILL:

- * **KNOW** what kinds of pressures global water supplies face.
- * Be able to **INFORM** your friends and family about the issues and possible solutions.

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

C.01 HOW THIRSTY IS YOUR COUNTRY? Are any parts of

- LEVEL 3 ③ your country facing **water scarcity** or **water stress**?
LEVEL 2 ② Are any areas prone to **drought** or **flood**? Find
LEVEL 1 ① information about the water situation in your country. Younger groups can 'interview' friends and family members; older groups can research statistics, data and news archives. What kinds of projects are going on to improve water management? Are there any ways you could get involved? Present your findings to the group.

C.02 WATER FILTER Collect a water sample from a stream or

- LEVEL 3 ③ pond, and examine it through a microscope or magnifying
LEVEL 2 ② glass. Then filter it by building your own water filter.
LEVEL 1 ① Visit this website to learn how:

library.thinkquest.org/04apr/00222/filter.htm.

What kind of plants and/or animals have you collected in your filter? Look at these under the microscope as well. Does the water seem polluted at all? (If it does, don't drink it and be sure to wash your hands afterwards.) What tests could you do to find out? If you have time, you can repeat these steps, comparing water samples from different water sources – a river, a puddle and the sea, for example. What is similar? What is different?



CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

C.03 DIRTY WATERS Have there been any major incidents involving water (e.g. pollution, **drought** or **flood**) in your area or country recently? If possible, go to the place and talk to people about how the incident affected their lives. Older groups can do a case study of what happened and create a scrapbook of newspaper clippings and websites about the event and then put together their own analysis. How did it happen? How much damage did the incident cause? How did it affect aquatic wildlife, people's livelihoods and the economy as a whole? How can you prepare and adapt to become more resilient to this type of incident?

C.04 PAINTED PRESSURES Divide into small groups. Each group picks a kind of pressure on water supplies (e.g. population, **urbanization**, pollution, **climate change**, poor management). Sketch, paint or collage posters about that pressure. Hold an exhibition in your local community to inform them about the different pressures the world's water supplies face.

C.05 BRING OUT THE BARD IN YOU Split into small groups and script a short play about a community whose members rely heavily on water for their livelihoods. Perhaps some of you raise poultry, while others grow vegetables. Lately, your village has been facing a water shortage. Is this because of **climate change**, or because overuse has made your river run dry? How is it affecting your lives? What are some solutions? Let your imaginations run wild and then invite your family and friends to a performance of each group's play.



- C.06 CONTINENTAL THIRST** Split up into small groups. Each group should choose one continent and make a poster showing the continent's water-related figures. Every team member should work on a different country. Use this website as a reference point: www.fao.org/nr/water/aquastat/main/index.stm. If possible, find statistics and data about levels of **water scarcity** and poverty in the different countries. What are the factors behind water problems in the area you are researching? What could be done to improve the situation?

- C.07 CLIMATE CHANGE** Make a list of 10 major natural disasters (like hurricanes, tsunamis or earthquakes) that happened in the world over the last few years. How many of them were weather related? Research the ways in which **climate change** will impact natural hazards in different parts of the world. How does water fit into this? What are some ways in which water management can play a role in helping people adapt to climate change? Make a short presentation about your findings. To learn more about natural disasters visit: www.emdat.be/database

- C.08 WATER WITHOUT BORDERS** Learn about transboundary waters (water resources that are shared between two or more countries). Familiarize yourself with the potential for both conflict and cooperation in such a situation. Then split up your group to take on different roles: some will play countries in conflict over shared waters and a small group will play the mediators who step in to encourage cooperation. Was it easy to find a solution? What are some real-world examples of countries achieving this?
- C.09** Do any other activity approved by your teacher or leader.



SECTION D:

WATER FOR A BETTER WORLD

DO EITHER **D.1.** OR **D.2.** AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE.

AFTER COMPLETING OUR **WATER FOR A BETTER WORLD** ACTIVITIES, YOU WILL:

- * **KNOW** about water-related problems in other countries.
- * Be able to **THINK** independently and with others about how we could help.

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

D.01 AQUA AROUND THE WORLD Do you have friends from different countries, or whose parents come from different countries? Interview them about water usage and habits in their countries. Ask as many questions as you can think of, like: Do they drink tap water in your friend's country? If yes, do they clean it by boiling or filtering? Is water scarce or abundant where they live? Is it free? If not, how expensive is it? What ways do they have of conserving water? Then come back together as a group and compare water usage habits and water saving ideas from different countries. What do others do that you don't do, and vice-versa? (If you and your friends are mostly from the same country then organize a "United Nations of Water," where everyone picks a country to represent and does some research about its water usage. Then present your findings in the group and have a discussion/debate about what each country can learn from the others.)

D.02 WILD IDEAS Many people have come up with innovative ways to address water problems. For example, take a look at PlayPumps, a cool merry-go-round that pumps clean water! (kids.nationalgeographic.com/kids/stories/peopleplaces/playpumps/). Now, let your imagination run wild and come up with your own idea for bringing clean water to people. Are any of your ideas feasible? Choose one (or more) of the best designs and try to make it.



CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

D.03 A BALANCING ACT In many countries, women and children

LEVEL 3 ● walk long distances to fetch water and bring it back home by

LEVEL 2 ● carrying it on their heads, backs, or hips. Water containers

LEVEL 1 ① usually hold about 20 litres of water, weighing 20 kilograms. This can be very harmful to their health over the long run. Practise walking around your garden or classroom with a book balanced on your head. Make sure it's not too heavy! How does it feel? Imagine how much harder it would be to carry a heavy water container over a long-distance, over bumpy, difficult land.

D.04 ROCKIN' THE BOAT Pick a song you like and

LEVEL 3 ③ rewrite the words to spread a message about

LEVEL 2 ② water. Then hold a group concert to perform all

LEVEL 1 ① the different songs.

GOOD IDEA

D.05 FOLLOW THE FLOW Create a flow chart of water's trickle

LEVEL 3 ③ effect (pun intended!) in people's lives. Which aspects of our

LEVEL 2 ② lives depend on clean water and **sanitation**? Then draw the

LEVEL 1 ① alternative: how does lack of water and sanitation, or access only to unclean water, impact people's lives?

D.06 HEALTH Invite an expert to come to your meeting to talk

LEVEL 3 ③ about different water-related diseases and how they

LEVEL 2 ② are caused. How common are they where you live?

LEVEL 1 ① How does this compare to other parts of the world? How easy is it to solve this problem? Create a poster or leaflet explaining how to avoid catching a water-related disease.

GOOD IDEA

D.07 QUIZ CONTEST Split into two teams. One will compile a list of questions on water and the other on sanitation. Examples could be: How many people live without a proper toilet in the world? How many children die of water-related diseases each year? Then quiz each other and see which team gets the most correct answers.

LEVEL
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D.08 GLOBAL SOLUTIONS Different countries are working on different ways to increase their water supply and use it more efficiently. In many countries in the Middle East, **desalination** has proved to be a good solution. Make some salt water and try to desalinate it – you can try the method here: <http://scienceillustrated.com.au/blog/in-the-mag/do-it-yourself-science-projects-make-your-own-solar-desalination-plant/> or come up with your own ideas.

LEVEL
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D.09 WATER AS A HUMAN RIGHT Do some research on **human rights**. What are human rights? Why are they important? Then dig deeper to learn about why the UN declared access to clean water a human right. Do you agree that it is a human right? Which human right do you feel strongest about? Discuss these questions as a group and see if anyone is able to change your mind.

LEVEL
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D.10 WATER PRICING Should water be free? Or should people have to pay for water? Water pricing is a very controversial topic and there is plenty of debate and discussion around it. Split into teams, each on one side of the argument. Then spend time researching the issue. Visit this website as a starting point: www.sswm.info/category/implementation-tools/water-use/software/economic-tools/water-pricing-general. In your next meeting, hold a debate on the topic.

LEVEL
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D.11 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

SECTION E:

TAKE ACTION

DO EITHER **E.1.** OR **E.2.** AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE.

AFTER COMPLETING OUR **TAKE ACTION** ACTIVITIES, YOU WILL BE ABLE TO:

- * **ORGANIZE** and participate in a community initiative to save water.
- * **CONVINCE** other people to join in the efforts to protect Earth's water supplies!

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

E.01 SPREAD THE WORD As a group, organize an event to

LEVEL 3 spread the word about water, or raise funds to help bring
 LEVEL 2 clean and accessible water to people around the world.
 LEVEL 1 1 Look up international actions for water and **sanitation**,
 such as World Water Day, World Toilet Day, or UNICEF's Tap
 Project (www.taproject.org/volunteer) for ideas and
 to see how you can get involved. Find out if any events
 are taking place in your area that you could join in with.
 Otherwise, put together your own, and use campaign
 materials from the project's website.

E.02 CLEANING TIME Is there a dirty river, pond, lake or
 LEVEL 3 beach in your area? Get some local experts on board and
 LEVEL 2 head over there with your class or group to help clean
 LEVEL 1 1 it up! Take a photograph before you start working. You
 can use nets to remove rubbish from the water and pick
 up rubbish from the banks or beach. Make sure an adult
 explains how to do this safely (e.g. by wearing gloves) and
 without disturbing the local wildlife. Can you think of any
 water-related songs to sing while you work? When you're
 done, take another photograph of the place. If it's safe,
 you can keep the rubbish (e.g. plastic bottles) you have
 collected and use it to make a collage or sculpture. Display
 your artwork publicly (e.g. at your school or meeting
 centre), alongside with your before and after photos, to
 raise awareness about littering and pollution. Contact your
 local media (newspapers, TV, etc) to tell them about what
 you have done.

CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

E.03 WATER PLEDGE Convince your friends and families to join you in saving water. Draw up some 'Water Pledge' certificates for them to sign. Before signing, get each of them to write down how they will save water on the certificate (e.g. by not letting the tap run while brushing teeth; by taking shorter showers; by having the car washed less often, etc.) You can find more ideas here: www.wateruseitwisely.com/100-ways-to- conserve/index.php). Check up on them to make sure they're keeping their promises! For example, you can get everyone together two weeks later to talk about how easy or difficult they've found it to keep their promises. You can make a special Award Certificate to reward the most creative solution for saving water.

E.04 BUILD A WELL As a team, research the various charities working on water. What kinds of projects excite you the most? Are you interested in building a well in Rwanda or in helping a sanitation project in Bangladesh? Pick a project and then organize an event together that will raise funds and awareness for the project of your choice. Perhaps you can hold a bake sale or a "walk for water".



GOOD IDEA

E.05 COMMUNITY WATER PROJECT Create a community project in your group or school to conserve water, such as starting a water efficient vegetable patch, or setting up a rainwater storage system.

E.06 BOTTLE WEANING Find out if tap water is safe to drink in your area. If not, what are the dangers of drinking it? Is it safe to drink after boiling or filtering it? Work with a local supermarket to find out how much bottled water is being bought in your community. If it is safe to drink tap water, or if boiling/filtering will make it safe, conduct a campaign to convince your neighbours to switch from bottled to tap water. Use social media to spread the word. To start you off, here are some reasons why bottled water is harmful to the environment: www.canadians.org/water/issues/Unbottle-It/factsheet.html and www.storyofstuff.org/movies-all/story-of-bottled-water.

LEVEL 3
LEVEL 2
LEVEL 1

E.07 WATER CITIZEN Write to your government representative about a water issue that worries you and ask them to take action. Don't forget to include some suggestions for solutions!

LEVEL 3
LEVEL 2
LEVEL 1

E.08 BLOG IT! Create a class blog on all things about water. You can write about the importance of using water sustainably and your ideas for doing so. But you can also get creative and include poetry, essays, stories or short videos about water too! Send the link to your friends and family (and YUNGA!) and invite them to follow and comment on your blog. Make sure you keep it updated – make a commitment to update it at least once a month.

LEVEL 3
LEVEL 2
LEVEL 1

E.09 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

RESOURCES

AND ADDITIONAL

INFORMATION

STAY UPDATED

This challenge badge is one of several complementary resources and activities developed by YUNGA and its partners. Please visit www.yunga.org for additional resources or subscribe to the free news letter to receive updates of new materials by sending an email to yunga@fao.org

SEND US YOUR EMAIL

We would love to hear about your experience of undertaking the challenge badge! Which aspects did you particularly enjoy? Did you come up with any new ideas for activities? Please send us your materials so we can make them available to others and gather ideas about how to improve our curricula.

Contact us at yunga@fao.org

CERTIFICATES AND BADGES

Email yunga@fao.org for certificates and cloth badges to reward course completion! Certificates are FREE and cloth badges can be purchased. Alternatively, groups can print their own cloth badges; YUNGA is happy to provide the template and graphics files on request.



PLAMENA DIMITROVA GEORGIEVA, aged 19, BULGARIA

WEBSITES



IMAGINE ALL THE WATER is a fact-filled website hosted by the EU Generation Awake project. It gives you practical tips to help you understand and reduce your water footprint. www.imagineallthewater.eu/EN Also be sure to explore Generation Awake's interactive environmental impact house!
www.generationawake.eu/en



THE KEY WATER INDICATOR PORTAL displays national-level statistics on water resources and uses, with global coverage. The portal has been developed by UN WATER and can be found at:
www.unwater.org/statistics_KWIP.html
It has been implemented by FAO Aquastat:
www.fao.org/nr/water/aquastat/main/index.stm



FAO WATER is a portal dedicated to water's role in food and agriculture. Interesting facts and educational materials can be found at:
www.fao.org/nr/water/promotional.html



THE NATIONAL GEOGRAPHIC FRESHWATER INITIATIVE is a global effort to inspire and empower individuals and communities to conserve freshwater and preserve the extraordinary diversity of life that rivers, lakes, and wetlands support. The website provides learning materials, quizzes and ideas on how to conserve water. http://environment.nationalgeographic.com/environment/freshwater/about-freshwater-initiative/?source=freshwater_module_whycaewater



ONE DROP explains the water crisis and suggests ways to get involved:
www.onedrop.org/en/default.aspx



THE UNITED STATES GEOLOGICAL SURVEY (USGS) WATER SCIENCE SCHOOL offers information on many aspects of water, along with pictures, data, maps, and an interactive centre where you can give opinions and test your water knowledge: <http://ga.water.usgs.gov/edu/>



UN WATER FOR LIFE DECADE is a site dedicated to water's importance for development, divided into different focus areas such as gender and water, transboundary waters and integrated water resources management: www.un.org/waterforlifedecade/index.shtml



UN WATER and the UN-Water Decade Programme on Capacity Development have useful statistics related to water and urbanization, climate change, and other issues. Find interesting factsheets at: www.unwater.org/factsheets.html. Also check the UN-Water Activity Information System (UNW-AIS) to find out what kind of projects the UN is supporting in your country: www.ais.unwater.org/ais/aism/activity.php



THE WATER FOOTPRINT NETWORK is a dynamic, international learning community of issues related to sustainability, equitability and efficiency of water use. Their site contains lots of ideas, data and methods on water issues: www.waterfootprint.org/?page=files/YourWaterFootprint



WATER FOR THE MILLENNIUM DEVELOPMENT GOALS is a UNESCO site explaining how managing water resources wisely is crucial toward achieving each of the MDGs. webworld.unesco.org/water/wwap/publications/WWAP_Water_and_MDGs.pdf



WATER LESSON PLANS offers fun experiments and activities to help you learn water is life: ecosystems.psu.edu/youth/sftrc/lesson-plans/water



THE WORLD WATER ASSESSMENT PROGRAMME website offers basic information about the allocation of water in different areas including agriculture and energy. It also has helpful information about the risks to water and the kind of work that is being done to reduce them. www.unesco.org/new/en/natural-sciences/environment/water/wwap/facts-and-figures



WORLD WATER DAY (22nd March) focuses on the water's role in food security. Find fun campaign materials, interesting animations and information and events taking place around the world: www.unwater.org/worldwaterday/index.html
You can join the Facebook group too: www.facebook.com/UNWorldWaterDay

GLOSSARY

AMPHIBIAN: An animal that lives both in water and on land. Billions of years ago, amphibians were the first animals to start living on land. Modern amphibians include frogs, salamanders and newts. Today, most amphibians lay their eggs in the water, meaning that their young begin their life underwater. Adult amphibians live mainly on land, usually returning to the water only to reproduce.

AQUIFER: An underground layer of rock or soil that stores water.

ATOM: Everything in the world is made up of miniscule particles called 'atoms'. These particles are like small 'building blocks'. Different atoms combine to make up **molecules** of different substances.

BIODIVERSITY: The variety of all the different kinds of plant and animal life on earth, and the relationships between them.

CELL: All living beings are made up of tiny cells. Some **organisms** only have a single cell, but most have many different kinds of cells that have different kinds of functions in keeping the organism alive. For example, the average human body contains 10 trillion cells! All cells contain a lot of water and need a good water supply to be able to work properly.

CLIMATE CHANGE: A change in the overall state of the Earth's climate (such as temperature and rainfall) caused both by natural and human causes.

CONDENSATION: The process by which gas or vapour cools and turns into liquid (also see **evaporation**).

DEFORESTATION: Removing a forest or part of a forest, to use the wood (e.g. to make paper or furniture) or to use the land for something else, like farming or building on it.

DENSITY: Density is a measurement of how much something weighs relative to its volume. For example, a cube of cork weighs less than the same size cube of metal, so the cork is less dense. If a substance is denser, this means its **molecules** are more tightly packed together.

DESALINATION: The process by which salt is separated from water, so that pure water is left behind. For instance, when water **evaporates**, the salts and minerals dissolved in it are left behind. However, **desalinating** water on a large enough scale to provide fresh water for

everyday human use is expensive, as it requires special technology and a lot of energy.

DEVELOPING COUNTRY: A poor country which is trying to become more advanced economically and socially. The economies of developing countries rely heavily on agriculture, and there are many subsistence farmers (farmers which grow food for their families rather than selling it at the market).

DROUGHT: A prolonged period of unusually low rainfall, leading to a shortage of water.

ECOSYSTEM: A community of living **organisms** (plants and animals) and non-living things (water, air, soil, rocks, etc.) interacting in a certain area. Ecosystems don't have a defined size, depending on the interactions you are interested in, an ecosystem can be as small as a puddle or as big as an entire river or lake. Ultimately, the whole world is one big, very complex ecosystem.

EVAPORATION: The process by which heat turns a liquid substance into gas or vapour (also see **condensation**).

FLOOD: When an area of land becomes covered by water due to, for example, heavy rain. Rivers or lakes may flood the land around them.

FRESH WATER: Naturally occurring water that is not salty (e.g. in rivers, lakes and **groundwater**).

GREY WATER: Used or slightly dirty water (e.g. from sinks and showers). Also see **wastewater** and **sanitation**.

GROUNDWATER: Water located beneath the Earth's surface. This is the Earth's biggest storehouse of drinkable water.

H₂O: The scientific name for water. It's an abbreviation for the fact that a water **molecule** is made up of two hydrogen **atoms** (H – so H₂) and one oxygen atom (O).

HABITAT: The local environment within an **ecosystem** where an **organism** usually lives.

HUMAN RIGHT: Human rights are basic things which every human being is entitled to (like freedom or equality), no matter where we come from, whether we're male or female, how we look or what we believe.

In 2010, for example, the UN General Assembly declared access to safe drinking water and **sanitation** a basic human right.

HYGIENE: Practices, such as frequent hand washing, which help ensure cleanliness and good health.

HYDROPOWER: Energy generated by the force of moving water. This is a sustainable kind of energy (as opposed to fossil fuels like coal, oil and gas) because water is a **renewable resource** and also doesn't pollute the environment.

INDUSTRIAL WASTE: Materials (e.g. certain chemicals), left over from the manufacturing process that can be harmful to the water and environment if not treated and/or disposed of properly.

INFRASTRUCTURE: The basic facilities, services, and installations needed for a community or society to function effectively, such as transportation and communications systems, water and power lines, and public institutions including schools and post offices.

INTEGRATED WATER RESOURCES MANAGEMENT (IWRM): An inclusive approach toward managing water sources, involving coordination among different sectors and stakeholders (organizations and people affected).

IRRIGATION: Artificially watering land or soil to allow plants and crops to grow when there is too little rain or **groundwater** supply to feed them naturally.

MALARIA: A disease carried by mosquitoes, usually leading to high fevers and headaches. Malaria is a serious disease: in Africa, a child dies of malaria every minute.

MILLENNIUM DEVELOPMENT GOALS: A set of aims designed by the United Nations to halve world poverty, improve health and support human rights in developing countries by 2015. After 2015, the efforts to achieve these aims will continue as the 'Sustainable Development Goals'.

MOLECULE: When individual **atoms** stick together, they make up small clusters called 'molecules'. Different molecules make up different substances. Water, for example, is made up of molecules which contain two hydrogen (H) atoms and one oxygen (O) atom, which is why water's

scientific name is H₂O. An oxygen molecule is made up of two oxygen atoms, and is called O₂.

NATURAL RESOURCES: Natural resources are useful materials found in the natural environment around us. Water, soil, wood or rocks are examples of natural resources we rely on to survive. We need water for drinking, water and soil for growing food, wood for making paper and furniture and wood and rocks for building materials. And those are only a few of the uses we can put those resources to! Can you think of more?

NUTRIENT: A chemical which animals and plants need to live and grow.

ORGANISM: A living creature, like a plant, animal or microorganism.

PATHOGEN: A microorganism (a very small living being) which carries illness (e.g. a virus, bacterium or fungus).

PERSPIRATION: The release of sweat (water with chemicals dissolved in it) from **pores** in the skin of animals. Body heat makes the sweat **evaporate**, cooling the skin.

PORES: Small openings in the skin of an animal, needed for **perspiration**.

PRECIPITATION: The process whereby water vapour in the atmosphere **condenses** and falls in the form of rain, sleet, snow or hail.

RENEWABLE RESOURCE: A resource that can be replaced or replenished, either by the Earth's natural processes or by human action. Air, water, and forests are often considered to be examples of renewable resources. However, due to local geographic conditions and costs involved, many argue that water may not be a completely renewable resource in some parts of the world, especially in areas which rely on limited **groundwater** supplies.

RUN-OFF: The flow of water that occurs when the soil is saturated and excess water from rain, snow, etc. runs over the land surface, eventually returning to rivers and the ocean.

SALINITY: 'Saline' is another word for 'salty'. Sea water is naturally saline. Fresh water also has a small number of salts, however, if the salinity (the saltiness) of fresh water increases (for example, due to rising sea levels) this makes the water undrinkable and it can no longer be used for growing plants.

SANITATION: Maintaining clean, hygienic conditions that help prevent disease through services such as garbage collection and wastewater disposal (e.g. through a sewage system).

SATURATED ZONE: The area in the ground that is soaked with groundwater. The part closest to the surface is called the water table.

SLUM: A heavily populated urban area characterized by poor housing and low living conditions.

TRANSPIRATION: A process where moisture is released from tiny holes called ‘stomata’ (meaning ‘little mouths’ in Greek!) on the underside of plant leaves.

TURBINE: A mechanical device that rotates in circles. This moving energy can be put to uses like powering a mill or generating electricity. Turbines can be spun by moving water or high-pressure steam.

URBANIZATION: The process by which people move from the countryside to go and live in towns and cities, often in search of better jobs and living conditions.

WASTEWATER: Water that has been used and is no longer clean. Also see sanitation and grey water.

WATER CYCLE: The continuous movement of the Earth’s water, on, above and below its surface.

WATER SCARCITY: Water supplies are considered ‘scarce’ (too little) when annual water supplies drop below 1 000 cubic metres per person per year (*Source:* UN). That’s not even half an Olympic swimming pool per person each year! See also water stress.

WATERSHED: The specific land area that drains water into a river system or other body of water.

WATER STRESS: The situation arising when water supplies drop below 1 700 cubic metres per person per year (*Source:* UN). 1 700 cubic metres of water is only about two thirds of the water in an Olympic swimming pool, so not very much at all. See also water scarcity, which is even worse.

WATER TABLE: The upper surface (or level) of water stored underground in the saturated zone.

YOUR NOTES

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A series of horizontal dotted lines for writing, spanning most of the page width.




A series of 25 horizontal dotted lines for writing.



SEANWE DAPHNE NG, aged 15, PHILIPPINES

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Some of the illustrations in this booklet are a selection from the over 20 000 drawings received from various drawing competitions. See our website (www.yunga.org) or register to our free mailing list (by writing to yunga@fao.org) to find out about current competitions and activities.



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Bancroft Arnesen Explore aims to inspire and promote the achievement of dreams by empowering youth to explore issues that affect their world. Find out about the 'Access Water 2013: A Journey From Hope To Action' expedition at www.yourexpedition.com



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The World Association of Girl Guides and Girl Scouts (WAGGGS) is a worldwide movement providing non-formal education where girls and young women develop leadership and life skills through self-development, challenge and adventure. Girl guides and girl scouts learn by doing. The association brings together girl guiding and girl scouting associations from 145 countries, reaching 10 million members around the globe. www.waggsworld.org



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The World Organization of the Scout Movement (WOSM) is an independent, worldwide, non-profit and non-partisan organization which serves the Scout Movement. Its purpose is to promote unity and the understanding of Scouting's purpose and principles while facilitating its expansion and development. www.scout.org



THE YOUTH AND UNITED NATIONS GLOBAL ALLIANCE (YUNGA) IS A PARTNERSHIP BETWEEN UNITED NATIONS AGENCIES, CIVIL SOCIETY ORGANIZATIONS AND OTHER ENTITIES WHICH DEVELOPS INITIATIVES, RESOURCES AND OPPORTUNITIES FOR CHILDREN AND YOUNG PEOPLE TO LEARN, GET INVOLVED AND MAKE A DIFFERENCE.

YUNGA ACTS AS A GATEWAY FOR CHILDREN AND YOUTH TO PARTICIPATE IN THE ACTIVITIES AND INITIATIVES OF THE UNITED NATIONS.

WE ARE MANY. WE ARE YUNGA!



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The purpose of the **United Nations challenge badges** is to raise awareness, educate and, most of all, motivate young people to change their behaviour and be active agents of change in their local communities. Challenge badges are appropriate for use with school classes and youth groups, and are endorsed by WAGGGS and WOSM. They include a wide range of activities and ideas that can easily be adapted by teachers or leaders. Additional badges are available or are being developed on a number of other topics, including: Agriculture, Biodiversity, Climate Change, Energy, Forests, Hunger, Nutrition, the Ocean and Soils.

The **Water Challenge Badge** is designed to show the crucial role water plays for life on our planet as well as for human wellbeing. The badge looks at how our water supplies are affected by human pressures, considers solutions for how water can be used more efficiently and motivates young people to save water and engage in efforts to increase equitable access to clean water.

FOR MORE INFORMATION ON THIS AND OTHER MATERIALS CONTACT:



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