

Water Resources

Water is essential for life, agriculture, and industry.

Access to clean water is essential for people's health.

However, clean water and hygiene are not available to billions of people around the world: <https://sdgs.un.org/goals/goal6>.

The Sustainable Development Goals

The 17 Sustainable Development Goals (SDGs) were adopted by the United Nations in 2015 as a call to “end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity”.

You can find out more here:

<https://www.undp.org/sustainable-development-goals>

Water and the Sustainable Development Goals

SDG 6 (Clean water and sanitation) includes making sure everyone has access to clean water and sanitation (keeping things clean and removing waste).

Reducing pollution and overuse of water resources links to **SDG 14 (Life Below Water)**.

Conserving water and helping communities adapt to water scarcity also relates to **SDG 13 (Climate Action)**.

Water conservation

Water conservation involves using water efficiently to reduce unnecessary water use. Conserving water helps ensure there is enough for future generations and protects natural ecosystems.

Engineers develop technologies and systems to make water use more efficient and sustainable, such as:



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Drip irrigation: Water is delivered directly to the roots of plants through a network of tubes, reducing water waste and promoting healthy plant growth by providing precise and consistent hydration.

Greywater recycling: Water that has been used in sinks or baths can be used to flush toilets.

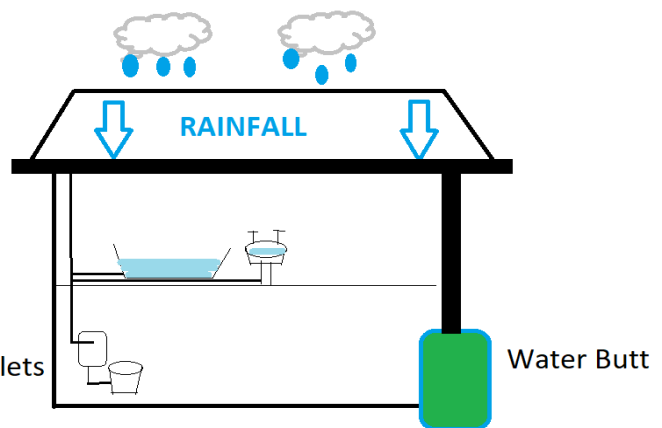


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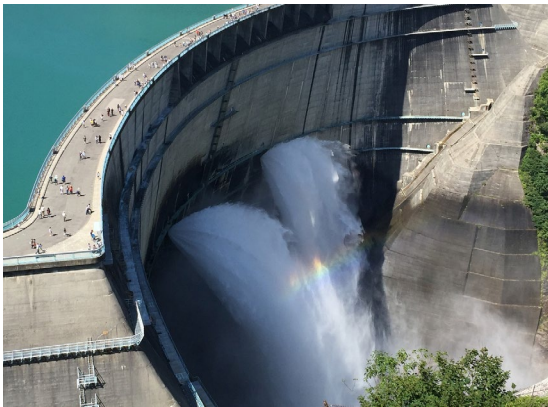
Rainwater harvesting: Collecting rainwater off the roof into gutters and then storing it in water butts. The water can then be used, for example in gardens.

Hydroelectric dams

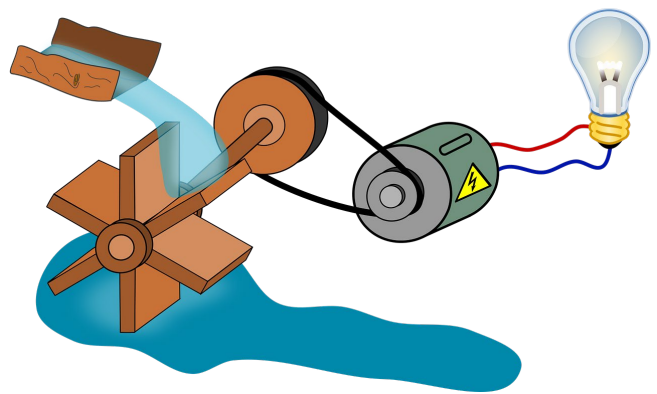
Hydroelectric dams generate electricity by using the flow of water to spin turbines connected to generators.

These dams help **manage water resources, control flooding,** and provide a **reliable source of clean energy.**

Engineers design dams to maximise energy production while minimising environmental impact.



A dam in Japan. Image: [funario](#) from [Pixabay](#).



An illustration of hydroelectric power generation. Image: [Jan Helebrant](#) from [Pixabay](#)

Renewable source generate more energy at some times than others, and we use more energy at different times of day. These don't always match up, so sometimes energy has to be stored until it is needed.

Energy storage facilities, such as Dinorwig Power Station in Wales, can be used alongside hydroelectric dams. They act as a reserve, quickly responding to rapid changes in power demand, and store excess energy produced at night.

During advertising breaks in popular TV shows, millions of people turn on electric kettles, causing a huge surge in electricity demand that Dinorwig helps manage.

Minecraft Challenge

Option 1: Design and build a **water conservation system** in Minecraft that serves a community of villagers.

Think about:

- **Greywater recycling**
- **Rainwater harvesting**
- **Drip irrigation**



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Option 2: **Manage a water source** such as a river or rain and show how it is conserved, used efficiently, and harnessed for energy.

For example, you could make a **hydroelectric dam**. You could watch our engineer Daisy's [YouTube tutorial](#) to help (from 10:00). Would you include a power storage facility?



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If you do not have access to Minecraft you could:

- draw your design
- build your own using simple materials.

Not an official Minecraft resource. This project was supported by the Royal Academy of Engineering under the *Ingenious Awards* scheme. Developed with Daisy Bristow, Robotics Engineer. For educational use only. Contact: sciencehunters@uwe.ac.uk.