

Climate Change Adaptation



(Photo: Keith Lankford)

Responding to climate risks and building
resilience.



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The purpose of these educational materials is to help young people understand the climate crisis on a systems level through engaging with the topics and foster agency through the skills and techniques of journalism.

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These educational resources have been developed to the best of our knowledge, using reliable and widely-recognised sources. While every effort has been made to ensure accuracy and clarity, we cannot guarantee that the materials are free from errors or omissions. Climate change is a field of knowledge that continues to evolve, and teachers and learners are encouraged to consult up-to-date scientific sources (e.g. IPCC, IPBES or national agencies) to complement and enrich these activities.

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Learning objectives

1. Understand the difference between climate change mitigation and adaptation, and explain why both are necessary.
2. Identify and evaluate different types of climate adaptation actions.
3. Recognise the importance of local knowledge, ecosystems, and systemic approaches in building climate resilience.

✓ GreenComp alignment:

- Systems thinking
- Adaptability
- Supporting fairness

Unit guide

This unit works well after introducing the science of climate change, as it shifts the focus from causes to consequences. It helps students understand what climate adaptation is, why it is necessary, and how it is already being implemented in different contexts around the world.

Begin with the "Vote with Your Feet" opening activity to highlight the increasing risks of climate-related disasters and the gap in global preparedness. This creates a clear entry point to the concept of adaptation. The 'Learn: Climate Change Adaptation' section should be completed before introducing the project instructions- you can either provide a lecture based on the text or assign it for independent reading. For the project, students can research a local adaptation example.



OPENING ACTIVITY

Vote with your feet

(10 minute activity)

Instructions

1. Clear space in the classroom to allow for students to be able to walk from one side to the other.
2. Read each question out loud.
3. Assign each corner of the room a different answer option.
4. Students move to the corner that represents the answer they think is correct.
5. After students make their choices, reveal the correct answer and briefly explain what it means.
6. Allow 1–2 minutes of discussion after each question.

Here are some statements related to climate change adaptation to get students thinking about the topic:

Are climate risks increasing?

Ask: Have weather-related disasters increased in the last 50 years, and if yes, by how much?

You can designate one side of the classroom (for example, the left corner) as the option where no increase has occurred, and the opposite side (the right corner) as the option where weather-related disasters have increased tenfold:



no increase

10x increase

Correct answer: According to the UNFCCC "The number of disasters has increased by a factor of five over the 50-year period, driven by climate change, more extreme weather, and improved reporting¹."

Applying the same logic, ask the following questions:

Are we preparing for increased climate hazards?

Ask: Out of all global climate money, how much goes to helping countries prepare for impacts (adaptation), rather than reducing emissions?

Correct answer: About 5-7%.²

Is preparation worth it?

Ask: "How many dollars in benefits does every \$1 invested in adaptation generate?"

Correct answer: Around \$4 in benefits (4x return).³



1. What is climate change adaptation?

You have likely learned a lot about the science behind climate change, such as greenhouse gas emissions and the impact rising concentrations of CO₂ in our atmosphere have on the global climate. But do you know what climate adaptation is and why it is important?

Climate change mitigation and climate change adaptation are two different types of climate action.

Climate change mitigation is about decreasing our greenhouse gas emissions and so mitigating the effects of climate change. It is about acting on the causes of climate change. However, no matter how fast we manage to decarbonise and reduce our emissions, climate change is already happening.

Climate adaptation is about preparing for the climate change impacts such as more frequent heatwaves, floods, droughts, storms, and sea-level rise. In other words, climate adaptation is taking action to adjust to the unavoidable impacts of climate change. Climate adaptation is acting on the consequences of climate change.⁴

The IPCC defines climate change adaptation as the “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.”⁵

Sometimes it is very clear if a certain activity is done for climate mitigation or adaptation purposes, but other times the line gets blurry. Many actions, such as climate change education, contribute to both. Very frequently, if not always, if we work with nature to tackle climate issues, we can see benefits that flow into improving both climate mitigation and adaptation objectives.





2. Why is climate change adaptation important?

Climate change is already happening and impacting people around the world. Seasons are shifting and droughts and floods are occurring more often, but people are adapting to these changes.

Climate adaptation can take many forms. It can be about food security and adapting the methods used for how we grow our food. It can be about making sure our infrastructure is resilient to extreme weather events such as floods. Or about establishing early warning systems that can warn citizens that a climate hazard is expected to occur so that people can act early to minimise its effects. A big part of climate adaptation is educating people on how they can change their behaviour to suit a changing climate.⁶

Climate adaptation is not just for scientists or governments. Local communities, youth, school and families are at the centre of climate adaptation. Climate adaptation, by its character, is realised locally, and when it is also led by people on the ground, it is more sustainable and equitable.⁷

Increasingly, the need for transformative adaptation is recognised. Transformative adaptation seeks to go beyond tweaking existing systems and aims for large-scale shifts in how things are done.⁸ This systemic and holistic approach makes connections across social, ecological and economic systems, focusing on justice and equity. Part of integrating justice into climate adaptation is to make sure that adaptation measures address and ameliorate social vulnerabilities rather than making them worse such as making sure that elderly people have access to cool spaces during heatwaves or ensuring poorer groups are not disproportionately affected by floods.





3. Working with nature for climate adaptation

Healthy ecosystems act like natural shields, buffers, and cooling systems. When we protect, restore them, or help them recover, they help protect us in return. Forests stabilise soils, prevent landslides, protect us from flash floods by taking up rainwater, and create cooler microclimates. Coral reefs and mangroves reduce the impact of waves on coastal areas, and provide habitat for many marine species, supporting fish populations that local communities depend on. Healthy rivers reduce flooding, improve water quality and act as a food source for people.

Healthy natural ecosystems store carbon which is why working with nature is both a climate change mitigation and adaptation solution.

So how can we work with nature to adapt to climate change?

If a natural ecosystem is already healthy with little anthropogenic disturbance, we can protect it. Protecting a natural ecosystem often means limiting human activities that impact the ecosystem. There are many levels of protection. For example, some protected areas allow traditional agriculture or grazing, while restricting construction and large-scale development. National Parks often do not allow any kind of human activity that could change the landscape or affect the ecosystem. Which level of protection is needed depends on the context. In some cases, completely banning human activities can have negative consequences that we should avoid such as threatening people's traditional ways of life, exclude marginalised people from accessing land they need for their livelihoods, and reducing the connection between local communities and the landscapes they have cared for over generations. Newer conservation approaches recognise that Indigenous people are already caring for the lands and waters where they live. In many cases, protecting nature also means protecting the long-standing traditions and relationships that Indigenous communities have with the natural world.

If nature around us is degraded, we can try to restore it and help it recover. Nature recovery is expanding across Europe, with efforts ranging from river restoration and forest regeneration to reviving wetlands and supporting pollinators. The aim of nature recovery is to restore natural processes, in some cases reintroducing species that can help this process. Nature recovery and rewilding are not suitable in all cases, such as when there is a risk of human-wildlife conflict that can result in causing more harm than good.

Climate actions that work with nature are called "Nature-based Solutions." You may have heard this term before, as it is becoming very popular. If this topic is interesting to you, you can use these terms to look further into it on your own!

Now let's look at a few examples of climate adaptation.



Case Study 1: Local knowledge and climate adaptation - Floating farms in Bangladesh

People have been adapting to climates throughout history by developing practices, livelihoods and cultures that are suited to local conditions. Think about the 'siesta' culture in the Mediterranean where people take naps after food- this has been suggested to be because of the warmer climate. Many houses that are in areas prone to flooding are traditionally built on stilts to protect them from rainy seasons and moving rivers.⁹ Although climate change is bringing climatic shifts that previous experiences have not fully prepared us for, we can still turn to traditional practices to help us reduce climate risks.

Floating farms in Bangladesh have existed for hundreds of years and are traditional practice. Bangladesh is a country prone to flooding. Each year between 30-70% of the country is impacted by floods.¹⁰ To be able to continue producing food during flood seasons, an old practice, *Baira*, developed which creates floating gardens that protect yield in times of flood.¹¹ Floating gardens are composed of rafts made from a local plant, water hyacinths, layered up to around 1 meter deep. These form raised gardens where soil and cow dung are put on top of the rafts and the vegetables and spices are planted. Many of the organic beds do not need chemical fertilisers as the plants absorb nutrients from the organic matter, including the cow dung, from the beds and water below. This construction floats on the river, going up and down as water levels change.¹²

This traditional practice is now coming back and expanding across Bangladesh.

Climate change is bringing more frequent and unpredictable floods to an already natural hazard prone country where erosion and floods affect between 10 and 70 million people each year.¹³ Floods and flash floods can easily destroy yields, impacting food security. Floating gardens, a technique that was dying out, are now seen as a way to adapt to the impacts of climate change.¹⁴

This example shows how important Traditional Ecological Knowledge is for adapting to climate change.



Watch this video to find out more about the floating gardens in Bangladesh - and see how they look!



Case Study 2: Mangrove restoration in the Philippines, among other places

Mangrove forests are remarkably diverse and important ecosystems. They support thousands of species, at all levels of marine life from bacteria to birds, fish, monkeys and turtles. Mangroves are used as nursery grounds for fish, its habitat is home to many species, while they also purify water, hold soil in place with their roots which decreases coastal erosion and protect land and coastal communities from storms and wave surges.¹⁵

Mangroves have been rapidly declining. Between 1985 and 2020 there has been a 21.6% reduction in global mangrove area.¹⁶ Currently about half of the world's mangrove ecosystems are at risk, mainly because of human activities.¹⁷ To reverse this trend, community initiatives in the Philippines are undergoing mangrove restoration projects.

Mangrove restoration is a climate adaptation action because mangrove ecosystems protect coastal areas from storm and wave surges, blocking between 70 and 90% of the force of the waves.¹⁸ They are also climate mitigation measures because of the high amount of carbon they store—research indicated that mangrove forests store five times more carbon compared to tropical forests.¹⁹ The Philippines has lost over 60% of its mangroves, mostly to expanding aquaculture.

To reverse this trend, local communities and Wetlands International began reviving the traditional practice of ecological mangrove restoration. Instead of simply planting trees, they restore natural water flows, reopen tidal channels, and help mangroves regenerate naturally, often alongside mangrove-friendly aquaculture in old fishponds. These restored mangrove forests act as natural storm barriers, improve water quality, support fish nurseries, and strengthen coastal livelihoods, building long term coastal resilience.²⁰



(Photo: Monica Escalera)



Case Study 3: Community-based early warning systems in Nepal

In parts of Nepal and northern India, communities living along small mountain rivers face sudden flash floods when intense rain falls upstream. To reduce risk, the International Centre for Integrated Mountain Development (ICIMOD) helped set up community-based flood early warning systems in rivers such as the Ratu and other tributaries in the Hindu Kush Himalayan region.

An early warning system is an integrated system designed to monitor hazards, forecast potential threats, and communicate timely information to enable governments, communities and individuals to take early action and reduce risk.²¹ Community-based early warning systems combine local knowledge with hydrometeorological forecasts to identify early signs of climate hazards and design effective ways to warn people and organise safe evacuation routes.²²

In Nepal, local people know what water levels are normal, dangerous, and when it is time to evacuate. They also have knowledge of which paths stay passable in floods, what houses are likely to flood first and where animals should move. This knowledge is used to set warning thresholds, evacuation routes and safe shelters, as well as to choose the people who monitor the river and pass messages.

This example shows how effective blending of scientific forecasting with local knowledge and community engagement can be in adapting to flood risk.

In Nepal, community-based early warning systems are designed to be people-centred, meaning that local residents play key roles in monitoring conditions, communicating alerts, and deciding how to respond to warnings. Simple, locally installed detection tools are paired with government-generated forecasts, and information is relayed through community focal points using SMS, radio, or local communication networks. Because the systems are developed with communities, not just for them, people trust the alerts and know exactly what actions to take, such as moving to safer ground, helping neighbours, and securing livestock and property. By combining technological monitoring with community preparedness and locally understood thresholds for danger, these early warning systems reduce the impact of sudden floods, which are becoming more frequent with climate change.²³



(Photo: Thilina Alagiyawanna)



Researching a local climate adaptation action

Research activity

First, identify one example of climate adaptation in your local area (or country). Examples could be flood protection measures, nature restoration projects, early warning systems...

When you found an interesting climate adaptation action, try to research answers to the following questions:

- What climate risk is this responding to?
- Who initiated it?
- Who benefits?
- Are there any trade-offs or limitations?
- Does the climate adaptation action work with nature to keep people safe?

Don't stop at these questions - many more are likely to come to mind when you dive into the case study.

Finally, write a short news-style article (400–600 words) explaining:

- The climate risk
- The adaptation solution
- Why it matters
- What challenges remain



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