Nature-Based Solutions for Climate Adaptation

Workshop: ***Duration:*** *1.5 hours (90 minutes)*

Setting: *Divide class into groups with 3-5 in each group*

Goal: *To empower youth to identify local climate change risks and design nature-based solutions to address them.*

Workshop

This workshop outline is designed to be engaging and practical, providing youth with the knowledge and tools to develop nature-based solutions for climate adaptation in their local areas. It's structured to be interactive, with a mix of presentations, group work, and discussion.

Why this matters to you

Nature Based Solutions (NBS) show that small, intentional changes can have a huge impact. As an individual you have the opportunity to support and champion thse kinds of solutions, whether it is through your further studies, career path or simply by advocating for them in your community. By understanding our eco-system and environment we learn how to build a better future.

1: Introduction and Context Setting (15 minutes)

A: Onboarding (5 mins):

Briefly introduce the workshop and the purpose. Get participants to share a favorite local green space, this will help set a collaborative tone.

B: Understanding your Local Area and Climate Risks (10 mins):

This section will provide the foundational knowledge needed for the group work.

What is a Nature-Based Solution (NBS)? *Define NBS as actions that protect, sustainably manage, and restore ecosystems to address societal challenges effectively and adaptively, while providing human well-being and biodiversity benefits. Suggest you have introduced the class to some of the video links prior, to ensure they've got a slight insight into climate change and Nature Based Solutions.*

Local Climate Change Impacts: *Present concise, locally-specific data on climate change risks. This could include information on increased flooding, heat waves, or drought based on the workshop's location. Show maps or data visualizations to make it more tangible.*
You can get inspiration from Climate-ADAPT, C3S (Copernicus Climate Change Services) or European Climate Risk Typology.

How to "Read" Your Local Area: *Provide a simple framework for participants to analyze their surroundings. Encourage them to consider:*

- ***Vulnerable Spots:*** *Where does water collect after heavy rain? Which areas lack green space and might be prone to overheating?*
- ***Existing Assets:*** *Are there any existing parks, wetlands, or green roofs that are already helping? (green / blue areas)*
- ***Community Needs:*** *What are the community's priorities? (e.g., more public spaces, cleaner air, etc.).*

2: Nature-Based Solution Methods (20 minutes)

Introduction to Different Approaches:

Present different nature-based solutions that can be applied to different urban and rural challenges.

Different approaches can be:

Urban Greening: *Discuss solutions like* ***green roofs****,* ***living walls****, and* ***urban parks*** *that help manage stormwater runoff, reduce the urban heat island effect, and improve air quality. You could mention that instead of building complex concrete drainage systems, cities are creating green roofs, rain gardens and urban parks. These green spaces absorb stormwater, reduce the urban heat island effect and provide habitats for local wildlife.*

Water Management: *Talk about how solutions such as* ***rain gardens****,* ***constructed wetlands****, and* ***permeable pavement*** *can help absorb excess water, filter pollutants, and prevent flooding. Water management is one of the most powerful applications of Nature Based Solutions. Traditional systems often use concrete pipes and canals to quickly remove stormwater away from cities, which can overwhelm rivers and cause flooding. With water management within NBS offer a smarter, more sustainable approach by slowing down, filtering and absorbing water where it falls.*

Ecosystem Restoration: *Talk about* ***reforesting*** *or* ***rewilding*** *local areas to create natural barriers against erosion, improve biodiversity, and sequester carbon. You can mention how planting trees in degraded areas (reforestation) helps absorb huge amounts of carbon dioxide from the atmosphere, which is crucial for fighting climate change. Forests also prevent soil erosion and provide clean air and water.*

Costal Restoration: *Talk about how communities are restoring* ***mangrove forests*** *and* ***oyster reefs*** *to protect coastlines. These natural barriers act as shock absorbers against storm surges and rising sea levels, while also creating vital nurseries for fish and other marine life.*

3: Group Work: Developing Local Solutions (40 minutes)

A: Group Formation and Task (5 mins): *Divide participants into small groups of 4-5. Each group will receive a large map or aerial photo of a specific local area (e.g., a park, a schoolyard, a street). The task is to identify a climate risk in that area and propose a nature-based solution.*

B: Brainstorming and Design (30 mins):

Groups will use the knowledge from the previous sections to:

Identify a Problem: *Based on the map, pinpoint a specific climate-related vulnerability (e.g., a parking lot that floods, a street with no shade).*

Brainstorm Solutions: *Discuss which NBS methods would be most effective for that problem. Encourage creativity and thinking outside the box.*

Draw and Annotate: *Use markers to draw their proposed solutions directly onto the map. They should label what each element is (e.g., "new park with rain gardens," "green roof on this building").*

C: Implementation Plan (5 mins):

Each group should briefly consider and jot down notes on:

Who needs to be involved?

(e.g., local government, community members, businesses).

What are the next steps?

(e.g., a community meeting, a proposal to the city council).

4: Group Presentations and Wrap-up (15 minutes)

A: Presentations (10 mins):

Each group will have 2-3 minutes to present their proposed solution to the other participants. They should explain the problem they identified and the NBS they designed.

B: Discussion and Next Steps (5 mins):

The facilitator will briefly summarize the presented ideas and emphasize that these are actionable solutions. Provide resources and information on local organizations, government initiatives, or funding opportunities for implementing such projects. Encourage participants to stay connected and continue working on these ideas. End with a positive and empowering message about the role of youth in climate adaptation.

Vocabulary:

Green Roofs *are rooftops covered with vegetation. Living laboratories for with multiple purpose from acting as insulators to help buildings stay cooler in the heat and warmer in the cold, reducing energy consumption and costs, absorbing and filter rainwater to help when extreme rain and reduce the strain on the city sewer systems. The plants on green roofs absorb carbon dioxide and other pollutants, improving air quality.*

Living Walls *– also called vertical gardens – are plant-covered walls which can be installed on the interior or exterior of buildings. They help improve air quality by filtering out airporne pollutants and act as a natural form of insulation and soundproofing to make indoor spaces more quiet and more energy-efficient.*

Urban Parks *are large green spaces in cities which serve as a crucual connection to nature. Often referred to as the 'lungs of the city' as they produce oxygen and absorb carbon dioxide. They also combat the urban heat island effect which is when cities are significantly hotter than surrounding rural areas due to pavement and buildings. Trees and plants provide shade and release moisture, cooling the air and then they are a provide habitats for urban wildlife.*

Rain Gardens *are shallow, landscaped depressions that that collect runoff from roofs, driveways or lawns.Filled with native plants that can handle both wet and dry conditions, rain gardens act like a sponge. They allow water to slowly filter into the ground, reducing the amount of runoff that enters storm drains and preventing erosion. They also filter out pollutants like fertilizers and pesticided before they reach local waterways.*

Vocabulary:

Constructed Wetlands *are man-made systems that mimic the functions of natural wetlands. They are essentially a series of shallow ponds densely planted with aquatic vegetation. As water flows through the wetland, the plants, soul, and microorganisms work together to filter out pollutants. They can be used to treat everything from urban stormwater to wastewater. Beyond just what purification, contstructed wetlands also create valuable habitats for wildlife and can be beautiful recreational areas.*

Permeable Pavements *are unlike traditional concrete or asphalt, permeable pavements which have a porous surface that allows water to seep through it into a gravel and soil base below. This simple change helps prevent water from pooling on streets and parking lots, reducing urban flooding and replenishing groundwater. It is a way to build necessary infrastructure while still allowing the natural water cycle to function.*

Reforesting *is the direct planing of trees to restore a forest that has been damaged or destroyed for example by logging or fire.*

Rewilding *is a holistic approach to ecosystem restoration. Instead of planing trees it focuses on letting nature take its course by stepping back and allowing natural processes to re-establish themselves. This can involve reintroducing key species that were once part of the ecosystem but have since disappeared (like beavers or wolves). The goal of rewilding is to create self-sustaining ecosystems that don't require human management.*

Vocabulary:

Mangrove forests *are dense, salt-tolerant trees and shrubs that grow along tropical and subtropical coastlines. They are an incredible natural defence system for coastal areas. The primary purpose of mangrove forests in coastal restoration is to provide anatural barrier against storms and erosion. Their complex, tangled root systems act like a net, trapping sediment and stabilizing the shoreline. This reduces the impact of storm surges, tsunamis and strong waves, protecting coastal communities and infrastructure. Mangroves are also highly effective 'blue carbon' sinks, meaning they store vast amounts of carbon in their roots and the surrounding soil. Like all natural areas they also create vital habitat for a wide range of matine life, serving as nurseries for fish, crabs and other species.*

Oyster Reefs *are living underwater structures formed by colonies of oysters that attach to each other and to hard surfaces. They are an essential part of a healthy coastal ecosystem. The main purpose of oyster reefs in coastal restoration is to improve water quality and provide habitat. Filter feeders like oysters can filter a remarkable amount of water, removing pollutants, excess nutrients and sediment. This process makes the water clearer, which allows sunlight to penetrate deeper, supporting the growth of vital seagrass beds. The reefs themselves create a complex, three-dimensional habitat that serves as a refuge asnd nursery for countless fish, crabs and other invertebrates. They also function as natural breakwaters, reducing wave energy and protecting the shorline from erosion.*

Links:

Climate change intro:

https://youtu.be/G9t__9Tmwv4?si=VpKsgNKNVKiHIVrl

https://youtu.be/jAa58N4Jlos?si=Mc3e2Qxt3loEUfVP

Nature based solutions:

https://youtu.be/4-unUVfAwsQ?si=fKGZD400vMSaSRtI

https://youtu.be/d_chfgwAnCo?si=cKaO5qGd5VB_ZTy-

https://youtu.be/9Yq2OPJR-a4?si=fhu2ZZhFyx8KtbfB