Chapter Three: Climate Solutions for Restoring Planetary Health

Responding to the climate crisis and trying to stop it from getting worse is overwhelming! This chapter provides an overview of the key solutions for restoring planetary health in a way that safeguards the future of nature and future generations!

Taking Action to Stop the Climate Crisis

Tackling the climate crisis requires looking at the root cause, which we learned is an increase in greenhouse gas emissions mainly from fossil fuels, agriculture, and industry. The act of reducing greenhouse gas emissions is known as **mitigation.**

Mitigation Strategies

Mitigation activities include reducing the flow of greenhouse gasses in the atmosphere, whether through decreased consumption or through carbon capture. Most mitigation strategies fall into three broad categories:

- **Decarbonization**: Activities that reduce carbon dioxide emissions in human activities such as renewable energy, increasing energy efficiency, composting food waste, electrification of the transportation system or complete reduction in dependence on cars altogether.
- **Carbon sequestration**: Ecosystem-based activities that enhance, restore, and protect natural spaces that can store and suck in carbon dioxide from the atmosphere, such as forests, wetlands, and oceans. In addition to natural sequestration, technologies are also being developed to capture carbon, such as mechanical trees that capture carbon. However, it should be noted that nothing beats natural sequestration that can store carbon indefinitely and doesn't take energy intensive manufacturing to develop.

- **Policy Changes:** Creating and implementing policy changes that make mitigation strategies, like composting, using electric vehicles, or subsidizing reforestation efforts, more accessible and easier to accomplish from the individual to industrial levels. Additionally, cementing the phase-out of fossil fuels and reduction of fossil fuel subsidies through policy could put our world on a climate positive trajectory. .

Adaptation

Climate adaptation consists of actions taken to adjust to current and expected future impacts of climate change, such as sea-level rise and increasing temperatures. In other words, adaptation is “treating the symptoms” of climate change to make communities as liveable as possible! Adaptation can look like turning on the air conditioning unit when it's hotter than usual or installing early warning systems for floods, hurricanes, and heat waves. Climate adaptation can also mean taking advantage of climate impacts, such as longer growing seasons or crop yields in some areas.

As discussed in the previous chapter, not everyone is impacted equally by climate change. The degree to which someone, a community, or even an entire country has the potential to be impacted by climate change is known as vulnerability. Vulnerability is composed of the risk, or likelihood of a climate impact to occur, combined with the capacity to adapt (IPCC, 2007). For example, low-income individuals have less financial flexibility than wealthy individuals to adapt to a flood or hurricane that damages someone's home.
The impacts of climate change are already being felt, and only going to get worse without proactive actions to prepare and adapt. Further, even if we stopped emitting greenhouse gasses today, we would still be faced with long-term impacts that continue to unfold due to how significantly we've already changed the climate. Thus, adaptation gives us our best shot at preparing for changes and proactively creating a better future even as our climate changes. Climate adaptation strategies fall under three major categories:

- **Preparing People and Safeguarding Culture:** Building resilient foundations for poverty reduction, increasing access to basic services for primarily vulnerable populations, and uplifting cultural and traditional practices.
- **Providing Support:** Supporting businesses and communities with information, adaptation technologies, and finance to retrofit homes and safeguard livelihoods .
- **Protecting Infrastructure:** Revising land use plans and protecting critical infrastructure with proactive investments in public services such as power, water, transportation, and food security that may be impacted by climate change.

Knowing whether global warming influenced the probability or intensity of an extreme weather event can help people in affected communities develop recovery and resilience plans that match their future risk. Early warning systems (EWS) that publicly utilizes integrated communications systems to warn communities of potentially catastrophic climate events As a result, a successful EWS saves lives and jobs, land and infrastructures and supports long-term sustainability. To be effective and complete, an early warning system needs to comprise four interacting elements namely: (i) risk knowledge, (ii) monitoring and warning services, (iii) dissemination and communication and (iv) response capability. For example, in 2022, a city in Spain unveiled a heat wave naming and categorization system, which is the first weather warning system in the world to name dangerous, forecasted heat events that could help people prepare in advance of an upcoming heat wave (source).

Resilience

Adaptation is about making changes to survive climate change, while resilience is about the strength of an individual, business or community to cope with and recover from climate-related hazardous events ranging from frequent droughts and stronger storms, to failed harvests and sudden heat waves. Resilience often supports communities in bouncing forward to a stronger state following a climate disaster.

Like adaptation, resilience also relies on vulnerability to specific climate shocks and long-term changes. The most successful resilience strategies combine actions to mitigate and adapt to climate change. Examples of activities include:

- Cities creating risk assessments to identify the most vulnerable communities to the most likely climate impacts
- Tailoring early warning systems with technologies that are accessible to vulnerable people
- Enhancing access to insurance, particularly for low-income communities
- Investing in improved housing and road infrastructure in areas hit harshly and frequently by flooding or sea level rise
- Planting trees to reduce extreme heat in cities
- Adding air conditioners to schools
- Diverting stormwater through natural spaces or capturing it for use in times of drought

Resilience reminds us that we need to adjust how we work, play, and live to safeguard our future as humans on this planet.

Loss and Damage

Breaking our relationship with emissions from the start is the most important and best strategy for putting a stop to climate change. When emissions haven't been reduced quick enough to avoid impacts, as we are seeing today, adaptation steps in to support humanity. However, if not done proactively, adaptation may not be enough to save communities from suffering irreversible impacts to the property, land, livelihood, and cultures. These irreversible impacts are known as "losses and damages." Loss refers to the irredeemable impacts of climate change suffered by individuals, businesses and communities affected by climate disasters. Damage on the other hand refers to the impacts of climate events that impair the value, usefulness, or normal function of people or property affected by climate disasters.

Loss and damage was first recognized at the 19th United Nations Climate Conference in Warsaw, Poland in 2013 following calls from civil society after the catastrophic effects of Typhoon Haiyan (also known as Super Typhoon Yolanda) in the people of the Philippines. The recognition was increased in the Paris Agreement of 2015, in which loss and damage has a stand-alone article calling for the need to enhance understanding, action and support for countries experiencing it; however, the description also guarantees that liability is not attributed to developed countries for the effects of climate change.

Though financial losses (such as loss of employment) are common, loss and damage frequently refers to anything that money cannot buy back. Examples include the loss of traditional ways of living, family members, religious and cultural heritage sites, agricultural land, biodiversity, recreational sites and a sense of place among others. The intangible nature of non-economic loss and damage makes it more complex to identify, measure, calculate, and compensate for life-altering climate-related disasters or slow onset events. .

Low-income and developing countries, particularly low-lying and small islands, are already starting to experience loss and damage. The small island of Vanuatu is already requesting funds to support the relocation of dozens of families due to rising sea levels (source), while Pakistan is still recovering from floods that drowned one-third of the country in 2022 (World Bank report). These stories will only become more common the slower we mitigate and adapt to climate change.

Image showing the impact of climate change in frontline communities (Grantham Institute)

Recall that nearly half of the global population is vulnerable to climate risks right now! Thus, you don't likely need to look far to see impacts occurring in your community. As you reflect on potential losses and damages in your community, think about the different ways you may be more vulnerable and how your climate champions projects can help address the most alarming issues.

Race to 1.5 Degrees: Is it too late to save the planet?

It's not too late, but it might be too late to save everything. If we do not take action, we could see as much as 3 degrees Celsius of warming (source). With just 1.1 degrees Celsius of warming, communities worldwide are already experiencing the harms of climate change. Even though we are already facing rising tides, changes in weather patterns, and human health issues, it is important that we continue to work to keep it from getting worse. The scientific community and nations around the world have called for global average temperature rise to stay well below 1.5 degrees Celsius. That is considered a **tipping point** for climate change, after which climate related impacts are projected to hurtle rapidly towards dangerous results that could cause irreversible damage and catastrophic impacts to all life on Earth. So, what actions can we do now to start changing our trajectory and avoid the climate tipping point?

According to an analysis by Rewiring America, about 42 percent of household emissions stem from the decisions made in the kitchen. This number increases to 65 percent if we include

offices, buildings, and vehicles and the decisions made from our office desks. Though there's a lot of policy change needed to address climate change, there's a lot we can do as individuals too!

1. Embrace Renewable Energy

Renewable energy harnesses the power of the wind, sun, water, tides, and other planetary resources (such as geothermal heat, which is derived from underground geothermal vents). Globally, renewable energy is cheaper than fossil fuel based energy too! If possible, consider raising funds to create a solar microgrid in your community or install solar panels on your roof.

2. Live Energy Efficient

The term "energy efficiency" is defined as how well something uses energy, or how much "work" a unit of energy can provide. Most electricity is consumed in our homes, offices, and factories, to power everything from heating and cooling systems to lights, computers, refrigerators, and cell phones. Houses and buildings are notoriously inefficient, which drives up our bills and emissions. You can save money and use less energy to do the same job by increasing the energy efficiency of home appliances and only using energy when you need it.

3. Electrify Everything

Electrifying everything refers to replacing fossil fuel economy with clean energies and energy systems that use electricity. From our cars and public transportation systems to our heating appliances, it's important to electrify everything we can to reduce emissions.

4. Reimagine Your Relationship with Agriculture and Food

Between 19 and 29% of global emissions can be attributed to the agriculture sector (source) in particular due to the farming of monocultures (such as oil palm, rice and corn) and livestock. Being aware of where our food comes from, and its overall impact is a critical step we can all take even without being a farmer!

- Eat locally sourced food to avoid transportation emissions.
- Support policy changes that minimize the use of heavy pesticides and chemicals in livestock farming and crop production.
- Reduce your meat consumption, particularly meat produced in factory farms or other unsustainable methods, wherever possible.
- Don't be afraid to shake up the food industry and call out unsustainable practices in your community.

5. **Let the Land and Forests Breathe**

Restoration, protection, and maintenance of natural carbon sinks, like forests, can make a huge difference in tackling climate change! Do what you can to halt deforestation, find alternative ways to cook food that are not reliant on burning wood, and promote agroforestry systems that encourage farmers to integrate crops with trees and shrubs rather than removing all the trees on land; encourage and advocate for backyard farming to grow more in a small places against industrial agriculture that encroaches into the forest.

6. **Build Better Buildings**

A large share of emissions comes from our buildings! Improve building energy efficiency by switching to energy efficient light bulbs, installing EnergyStar-certified appliances (such as hot water heaters), and improving insulation. Consider adding solar panels or green roofs to your building that provide clean energy and natural cooling effects, respectively. Additionally, encourage your building to invest in composting and reusable dishware to minimize waste sent to the landfill that causes a build up of methane emissions

7. **Ride in Style**

The transportation sector accounts for nearly 25% of all greenhouse gas emissions with 95% of the world's fuel for transportation coming from fossil fuels (source). Consider investing in an electric vehicle or electric bicycle that can often be charged at home to minimize emissions. Better yet, consider getting rid of your car entirely and relying on public transportation, biking, or walking where you need to go! If your community isn't public transportation accessible, consider carpooling to reduce cars on the road.

Building Resilience to Climate Change

Climate change will continue to worsen and accelerate in the coming years, wreaking havoc on the health of our oceans, forests, rivers, and towns and cities. While we must cut greenhouse gas emissions to avert the worst effects of climate change, we must also prepare for unavoidable consequences such as sea-level rise and more frequent and severe extreme weather. Recall that not everyone is equally impacted by climate change, with the most vulnerable who have the least capacity to adapt being the most likely to be hit first by climate impacts.

Many developing countries, and even some parts of developed countries lack economic or technological resources, making preparation more difficult. The government may play an essential role by funding climate science and impact research, revising Federal Emergency Preparedness Plans to include anticipated climate change consequences, offering planning tools to assist communities and companies in identifying what is at risk, and sponsoring climate education.

Many key concerns are being considered by scientists and leaders, including:

- What repercussions (such as droughts, heat waves, floods, and sea-level rise) are projected to influence our area?
- How many people and species in our area might be affected by climate change ?
- How soon will we feel the worst impacts of climate change and what re we redy to deal with right now?

What Can You Do to Increase Your Resilience?

- Be Prepared: Prepare for extreme weather by keeping an emergency kit on hand. An emergency pack should have vital phone numbers and copies of important documents, as well as flashlights, mobile phone chargers, nonperishable food, water, and other items.
- Local Initiatives: Review your city's climate resilience or adaptation initiatives to gain insight on the potential impacts facing your community and resources for adapting. If your city doesn't have a resilience or adaptation initiative, consider making one for your community or calling upon policymakers to request one.

- Country Initiatives: Several countries have recognized the need for adaptation planning and have created National Adaptation Plans.

The Role of Nature in Tackling Climate Change

Nature-based solutions are "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits (UNEP). In short, nature-based solutions are sustainable design practices that weave nature into urban design (fig. 9). Estimates suggest that nature-based solutions can provide 37% of the mitigation needed until 2030 to achieve the targets of the Paris Agreement (World Bank report). Without nature, we won't be able to achieve the 1.5 degree Celsius goal of the Paris Agreement. The following figure provides examples of how nature-based solutions can enhance resilience.

Figure 9: How different Nature-based Solutions can work together across landscape to build resilience

The Role of Indigenous Peoples in Tackling Climate Change

Indigenous people are key to every pillar of tackling and adapting to climate change. Indigenous tribes around the world have managed forests and oceans sustainably for generations. They have lived in harmony with their environment as it changed.

Indigenous peoples interpret and respond to climate impact in creative ways, drawing upon traditional ecological and ancestral knowledge to implement solutions that may help society at large address climate change. Examples include:

- The Khasi Indigenous Community in India practices traditional food production systems rooted in jhum (shifting cultivation), home gardens, forest and water bodies rather than chemicals that help minimize topsoil erosion and buffer drought impacts (source).
- The Salish and Kootenai Tribes in the US, fought to regain control of their stolen lands back (source), which is helping preserve biodiversity even as the climate changes with the use of traditional indigenous methods.
- In Bangladesh, villagers are planting floating vegetable gardens to adapt to flooding, while communities in Vietnam are restoring mangroves to minimize the impacts of wave surges from tropical storms (source).
- FIn South America, indigenous peoples of Guyana decided to move to forested areas during droughts and plant their staple crop on floodplains normally too wet for other crops (source).

As such, it is important to not only learn from and collaborate with indigenous leaders, but work to support land tenure rights for indigenous tribes who have a proven track record of having a positive relationship with nature.