



ClimateSafe Villages

RESILIENT ECO-COMMUNITIES

CLIMATE RESILIENCE GUIDE



Extreme conditions to be aware
of relating to climate change,
and how to prepare

ABOUT THE CLIMATESAFE VILLAGES MOVEMENT

The nonprofit Mission of ClimateSafe Villages (CSV) is to form climate change resilient, disaster resilient and sustainable communities worldwide, founded in our commitment to respond and adapt to the urgent challenges of the climate change crisis and its wellbeing and economic impact. CSV is about empowering individuals, families, and entire communities by equipping them with the necessary resources, essential skills, and innovative technologies that promote climate change resiliency, disaster resiliency, self-sufficiency and sustainable practices for humans, animals and plants. CSV aims to work with similar communities for localization and cooperation, with an emphasis on food, seed, and resource sharing networks.

SV will unite these communities within a global network. Through mutual support, shared education, best practice models, and continual learning, CSV advances a sustainable and resilient future. We will foster an interconnected web of sustainable communities for a positive transition, further climate and disaster resilience, and contribute to a more viable and sustainable world for following generations.

Nowhere on Earth will be 100% safe from all climate change consequences. But we can create climate-safer locations and communities using the practices of climate change preparation, adaptation, and resilience building. ClimateSafe Villages will help you make wherever you live as climate-safe as possible using these practices.



ABOUT



Source: Permaculture Design: Tools for Climate Resilience, Oregon State University

Climate change is forecasted to increase the likelihood of “very large fires”, which are the largest 10% of wildfires that burn the majority of the land area in the United States. This is primarily due to the lengthening of fire seasons with the overall rise in temperature. The United States National Oceanic and Atmospheric Administration (NOAA) predicts that by 2042 in the Great Plains and Northwest portions of the fire-prone Western US, the number of weeks that a very large fire could occur will go up between 400-600%! In other areas of the Western US, it still goes up between 50-400%.

EXTREME FIRES



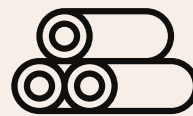
Assess: Research your location. Review local wildfire hazard maps. Identify the most likely direction from which a wildfire might approach



Fire Break Planning: Create a fire break between the direction of a potential fire and vital site infrastructure.



Planning Water Storage Structures: Essential for firefighting, fire breaks, and fire suppression, with water flow design as a primary element in site planning.



Structural Design for Fire Resistance: Focus on materials and design strategies to withstand flames, extreme heat, and flying embers.



Plan for evacuation: Plan multiple ingress and egress points on the property for safe evacuation.



As climate change intensifies, the danger of unlivably high temperatures becomes a stark reality for many regions across the globe. This phenomenon, a direct consequence of the ongoing rise in global temperatures, poses severe risks to both human and environmental health. Extreme heat events, which are becoming more frequent and intense, can lead to catastrophic health emergencies, including heat strokes and exacerbation of chronic illnesses. The elderly and young are highly vulnerable to the combination of high heat and high humidity, as their sweat glands are less able to pass off the heat fast enough. The increasing frequency of heatwaves also puts immense pressure on energy systems due to heightened demand for cooling, potentially leading to power shortages.

HEAT



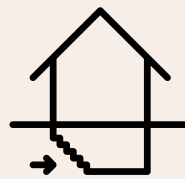
Back up energy source:

Prepare your air conditioning system with sustainable back-up energy sources in case of power outage.



Passive heating and

cooling: These systems utilize natural sources like sunlight, wind, or tools like heat pumps.

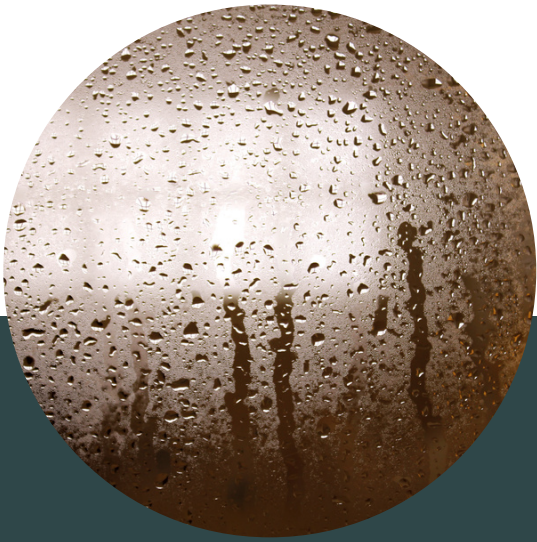


Basement: Plan areas for emergency cooling, food storage, and to deal with rising heat and regular power outages.



Structural Design:

Building or buying super-insulated, underground, bermed, or mostly underground homes is a wise way to handle multiple climate change risks.

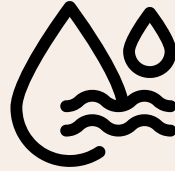


The human body relies on the ability to cool itself through sweating, but when humidity levels are too high, this process becomes less efficient. If the body cannot adequately dissipate heat, it can lead to serious health risks, including heatstroke and potentially fatal outcomes.

This issue is exacerbated as higher temperatures increase evaporation, leading to greater humidity and more moisture in the air.

Wet bulb temperature is a critical measure in this context, as it combines air temperature and humidity to indicate the body's capacity to cool itself. When wet bulb temperatures reach a certain threshold, human survival without artificial cooling becomes nearly impossible. Some regions, particularly in equatorial areas, have already experienced wet bulb temperatures exceeding this threshold.

HUMIDITY



Install and Maintain Dehumidifiers: These devices help reduce indoor humidity levels, making the environment more comfortable and safe, especially during peak humidity periods.



Passive heating and cooling: These systems utilize natural sources like sunlight, wind, or tools like heat pumps. Prepare with the tips from the Heat and Cold recommendations in the previous pages as well.



Avoid going outside during wet bulb temperatures: Adjust your daily schedule to avoid outdoor activities during the hottest and most humid parts of the day. If outdoor work is unavoidable, take frequent breaks in a cool, dehumidified environment, and stay hydrated.



The seemingly paradoxical prediction by climate science that severe cold spells will become more frequent in a warming world is rooted in the shifting behavior of the jetstream and other climatic changes induced by global warming. These alterations can lead to sudden and extreme drops in temperature, even in traditionally milder climates. If you reside in an area prone to these cold spells, it's crucial to prepare accordingly. Having an emergency backup plan is essential; this could include measures such as ensuring adequate insulation in your home to retain heat.

COLD



Back up energy source: Prepare your heating system with sustainable back-up energy sources in case of power outage.



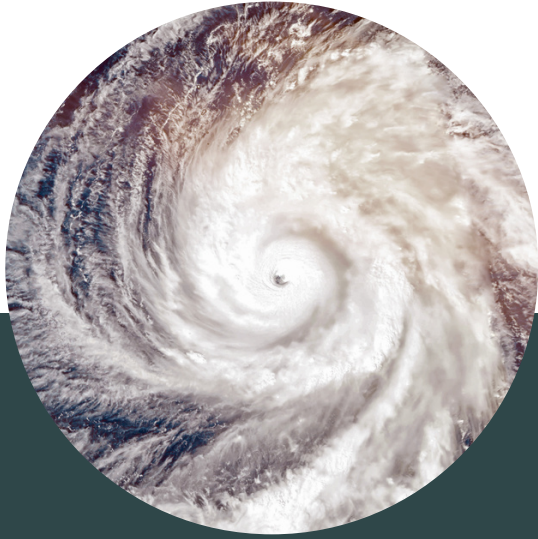
Passive heating and cooling: These systems utilize natural sources like sunlight, wind, or tools like heat pumps.



Wood burning stove: A nonpolluting wood-burning stove can be a sustainable and efficient way to provide heat during these unexpected cold periods.



Structural Design: Building or buying super-insulated, underground, bermed, or mostly underground homes is a wise way to handle multiple climate change risks.

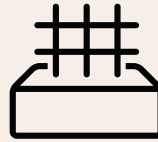


WIND AND STORMS

Increasing heat will also mean increasing and sporadic wind and wind speeds almost everywhere. Our atmosphere will increasingly "boil and churn" as it continues to warm each year.

This "pressure cooker" wind-increasing effect is because the top layer of our atmosphere acts like a pressure cooker lid keeping most of our climate change warming inside our lower atmosphere. Increasing winds worldwide will eventually become one of climate change's most damaging and consistent consequences.

For example, the western coast of the United States will have significantly increased 70-100 miles per hour wind events. If you live in a hurricane cyclone area, you must also prepare for the coming category six hurricane or cyclones with 180-240-mile-an-hour winds. Many locations will now be subject to wind Derechos of 100 mph or more.



Reinforce Structural Integrity: Reinforce roofs, windows, and doors. Install storm shutters and using impact-resistant materials.



Structural Design: Dome homes, concrete or steel reinforced homes, land termed houses, and underground buildings are wind-resistant.



Emergency supplies: Prepare emergency supplies in the event of a severe emergency or the need to evacuate.



Water becomes an invaluable resource as the risk of droughts intensifies with climate change. To ensure long-term survival and well-being, it is imperative to be situated on land that has access to a consistent, safe, and clean water supply. The stark reality is that a human can only survive for about three days without water, after which the risk of death escalates. Moreover, the quality of water is equally crucial. Contaminated water, teeming with harmful bacteria or viruses, can lead to severe illnesses, suffering, and often, if untreated, death due to waterborne diseases. Beyond personal consumption, water plays a pivotal role in sustaining a reliable food source. It is essential for cultivating a productive garden and is necessary for the care and survival of any animals or fish you might raise. |

DROUGHT



Water Storage: Use large-capacity tanks, cisterns, or barrels made from safe materials, with regular cleaning and maintenance to avoid contamination.



Rainwater Harvesting: Install gutters and downspouts to collect rainwater into storage containers, with treating and filtering.



Water Conservation: Adopt daily water-saving practices, use efficient appliances, fix leaks, implement xeriscaping, and reuse greywater for irrigation and toilets.



Drought-Resistant Agriculture: Choose drought-resistant plants and crops for your garden or farm, using mulching and drip irrigation to conserve soil moisture and water.



FLOODING

With temperature rise, more moisture is trapped in the atmosphere. This means that there are alternating risks of drought and then flood. When the moisture built up in the atmosphere releases, it causes powerful and destructive flooding.

As climate change progresses, extreme weather events, including intense and concentrated rainfall often described as "rain bombs," are expected to become more frequent and severe. These events can unleash several weeks' or even months' worth of rain within just a few hours or days, leading to significant flooding risks.



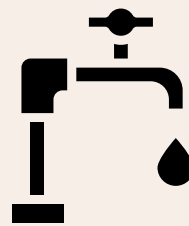
Drainage Systems:

Prepare drainage on your property and advocate for better municipal drainage systems.



Consider your location:

Be cautious about living near rivers, lakes, or within 1,000-year flood plains, recognizing that past flood patterns may no longer be reliable.



Upgrade Sump Pump

Systems: Pumps should be significantly larger than current standards to handle the potential volume of water, which in some scenarios could reach up to 30 inches over 48 hours.



Emergency supplies:

Prepare emergency supplies in the event of a severe emergency or the need to evacuate.



SEA LEVEL RISE

Estimates vary, but a general projection is a rise of approximately 2-3 feet by 2050. By the end of the century, in 2100, the sea level could rise by as much as 6-9 feet, according to the Intergovernmental Panel on Climate Change (IPCC) and other scientific studies.

The melting of global ice, including polar ice caps and glaciers, is a primary contributor to sea level rise. This melting is accelerated by increasing global temperatures.

In addition to gradual sea level rise, storm surges during extreme weather events can temporarily raise sea levels significantly, leading to severe flooding, especially in coastal areas.

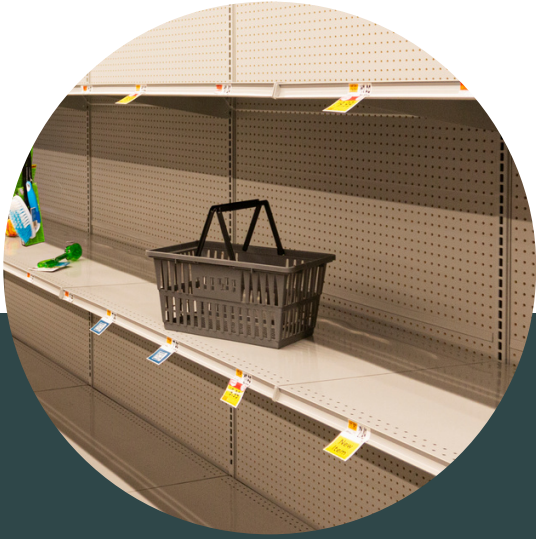
Any sea level rise, particularly in combination with the potential collapse of the Thwaites Glacier, poses a threat to coastal infrastructure.



Prepare for sudden sea level rise: The Thwaites Glacier in Antarctica, often referred to as the "doomsday glacier," is a significant concern. Its collapse could contribute an additional 2-3 feet to global sea levels over several decades. The timeline for this event is uncertain, with some estimates suggesting it could begin to collapse within a few years to several decades.



Review sea level projections for your area: Consider relocating if necessary to an area at least 25 -35 feet above the highest previously recorded flood, storm surge, or tsunami.

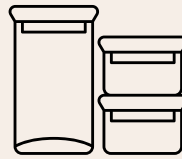


FOOD SCARCITY

Climate change poses a significant risk to global food security, with its impacts already being felt in various parts of the world. As extreme weather events become more frequent and severe, they disrupt agricultural production, leading to food shortages and increased prices. Droughts, floods, heatwaves, and unpredictable weather patterns adversely affect crop yields and livestock, undermining the stability of food supply chains. Additionally, the gradual changes in climate can alter growing seasons, reduce arable land, and exacerbate pest and disease outbreaks, further threatening food production. The vulnerability of food systems to climate change not only raises concerns about the availability of food but also about the nutritional quality and accessibility, particularly for communities already facing socioeconomic challenges



Expect Fluctuating Food Prices: Climate change impacts agricultural productivity, leading to potential disruptions in food distribution.



Plan for Long-Term Food Storage: Preparing for these uncertainties involves storing a significant amount of food - potentially up to a year's supply. This requires understanding proper storage techniques to maintain the quality and nutritional value of the food.



Develop Sustainable Food Sources: Cultivating your own food becomes increasingly important with climate change. This includes growing fruits, vegetables, and legumes, and potentially raising animals.

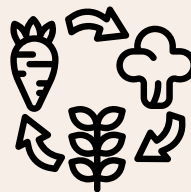


Climate change significantly impacts soil quality, a crucial factor in agricultural productivity and ecosystem health. As global temperatures rise, soil degradation accelerates due to increased erosion, loss of organic matter, and changes in soil moisture. Droughts, intensified by climate change, lead to hardening and cracking of soils, reducing their ability to retain water and support plant growth. Conversely, excessive rainfall and flooding can strip away topsoil, further diminishing its fertility. The increase in CO₂ levels also affects soil chemistry and nutrient balances, potentially altering the availability of essential nutrients for plants. Soil organisms, vital for nutrient cycling and soil structure, are also affected by these changing conditions, impacting overall soil health. These challenges underscore the need for effective soil management strategies in the face of climate change.

SOIL QUALITY ISSUES



Indoor Gardening and Controlled Environment Agriculture: Utilize indoor gardening techniques, such as hydroponics or aquaponics, to grow food without relying on soil quality.



Practice Sustainable Soil Management: Implement practices like crop rotation, cover cropping, and organic composting to maintain and improve soil health.

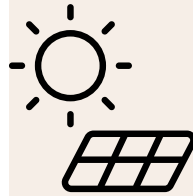


Use Soil Amendments and Mulching: Amend soils with organic matter to improve their nutrient content and structure. Bio-char is another soil improvement option.



The escalating impacts of climate change underscore the urgent need to shift towards greener sources of energy. Traditional fossil fuels contribute significantly to greenhouse gas emissions, exacerbating global warming and its associated climatic effects. Transitioning to renewable energy sources like solar, wind, and hydroelectric power is crucial for reducing our carbon footprint and slowing climate change. At the same time, as climate change intensifies, it brings more frequent and severe weather events such as hurricanes, floods, and heatwaves, which can disrupt traditional energy grids, leading to power outages. This growing unpredictability of grid energy necessitates planning for such contingencies. It's crucial to develop resilient energy systems and have backup plans in place.

ENERGY SCARCITY



Solar: Invest in solar panels to harness renewable energy from the sun



Small-scale wind: Consider installing a small-scale wind turbine for generating clean energy in areas with consistent wind patterns, especially suitable for rural or remote locations.



Energy storage: Implement a battery storage system to store excess energy generated from renewable sources like solar and wind, for use in outages or periods of low generation.



Passive heating and cooling: Use these systems and plan to minimize other energy uses and needs.



As the impacts of climate change intensify, the need for emergency medical supplies becomes increasingly critical. Extreme weather events, such as heatwaves, hurricanes, floods, and wildfires, not only pose immediate risks of injury but can also exacerbate chronic health conditions and disrupt access to medical facilities. These events can lead to shortages in essential medications, medical equipment, and health services, particularly in areas where healthcare infrastructure is already under strain.

HEALTHCARE



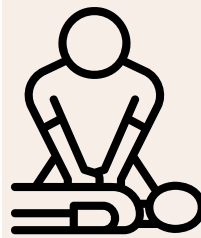
Emergency Medications:

Keep a supply of essential medications, both prescription and over-the-counter.



First Aid supplies:

Also keep first aid items such as bandages, antiseptics, pain relievers, and wound dressings.



Learn Basic First Aid and

CPR: These skills are invaluable during emergencies when immediate medical assistance is not available.



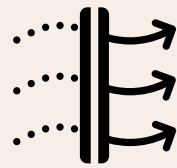
Take care of your health:

Exercise, eat well, and visit the doctor regularly to take care of your health and prevent illness. Also take care of your dental health and vision.



Climate change significantly exacerbates air quality issues, primarily through increased temperatures and altered weather patterns, which in turn affect pollutant concentration and distribution. Higher temperatures can intensify the formation of ground-level ozone, a key component of smog, particularly in urban areas. This exacerbation is often compounded by changing wind patterns and longer-lasting heatwaves, which can trap pollutants in the lower atmosphere, leading to prolonged periods of poor air quality. Additionally, wildfires and dust storms contribute substantial amounts of particulate matter to the air. Wildfire smoke is dangerous because it contains the extremely harmful and cancerous PM2.5 particles. Wildfire smoke is a growing risk, especially to vulnerable populations like children and the elderly.

AIR QUALITY AND SMOKE

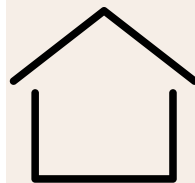


Invest in High-Efficiency.

Air Filters: These can effectively remove pollutants and improve indoor air quality. 2-3 micron or less filtration is best.



Monitor Local Air Quality Index (AQI): Plan activities accordingly.



Create Clean Air

Sanctuaries: Designate areas, such as a specific room with improved air filtration, as clean air sanctuaries, for high pollution days.



Increase Indoor Plants:

Plants such as spider plants and peace lilies naturally purify air.

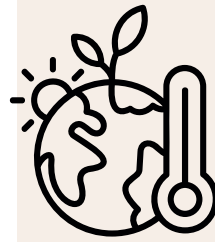


Climate change is increasingly becoming a critical driver of mass migration, as it exacerbates environmental conditions that compel people to leave their homes. Rising sea levels, extreme weather events, prolonged droughts, and intensified natural disasters, all consequences of a changing climate, are rendering vast areas uninhabitable or economically unviable. This scenario is particularly acute in regions where communities heavily rely on natural resources for their livelihoods. As arable land diminishes and water scarcity increases, agricultural communities face the stark choice of migrating or facing severe hardship. Additionally, the intersection of climate change with political and social tensions can amplify conflicts over dwindling resources, further driving displacement.

MASS MIGRATION

Understand and Monitor

Climate Trends: Stay informed about climate change trends and predictions, especially regarding how they might impact your region, to anticipate potential migration scenarios.



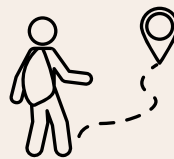
Consider your own

migration needs: Assess sea level rise, wildfire risk, and temperature changes. Consider areas between the 45th and 55th parallels, though local climate conditions will vary



Work with your local community to plan for climate migration:

Consider how migrants will be accommodated with an inclusionary approach. Consider and plan for challenges and conflicts.





ClimateSafe Villages

RESILIENT ECO-COMMUNITIES

NEXT STEPS

1

Join ClimateSafe Villages and participate in the discussion on Basecamp.

2

Join local discussion groups on CSV to find others in your area or who are looking to relocate.

3

Use our resource to build communities of resilience.

4

Donate to our efforts on our website!

ADDITIONAL RESOURCES

This guide is based on and/or recommends information from the following sources:

- Job One For Humanity - joboneforhumanity.org
- Permaculture Design: Tools for Climate Resilience, Oregon State University - <https://open.oregonstate.edu/catalog/permaculturedesign/>
- Introduction to Permaculture, Bill Mollison with Reny Mia Slay
- Biosustainable Designs - biosustainabledesign.org
- The New Complete Book of Self-Sufficiency, John Seymour

