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School-Based Disaster Risk Management Guidebook

Advancing the Leadership of Women and Girls Towards Better Health and Climate Change Resilience - Project Surmi

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School-Based Disaster Risk Management Guidebook

Acknowledgments

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Pathfinder *expands access to sexual and reproductive health services, opening the door to opportunities for women and all individuals to thrive—economically, educationally, and civically. Driven by our country-led leadership and local community partners, Pathfinder brings together a suite of services and programs that enable millions of people to choose their own paths forward.*

Our program, ***Advancing the Leadership of Women and Girls Towards Better Health and Climate Change Resilience****, builds the resilience of communities to withstand climate shocks and emergencies through women-led preparation, response, and recovery. The program positions women and girls as change agents in strengthening access to equitable health services and building community resilience to climate shocks—ultimately helping women forge their own paths to a healthier future.*

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Using the Guidebook

This guidebook is designed to provide essential content and practical tips for implementing a school-based risk reduction program, specifically tailored for secondary school-going children. It serves as a comprehensive resource organized into nine modules, each addressing prevalent climate hazards encountered by rural and urban communities in Pakistan: heatwave, drought, heavy rainfall & flood, earthquake, fire, lightning and smog in their phases of Prevention, Preparedness and Response. This is followed by a discussion of the prevention phase, which covers mitigation measures for all mentioned climate disasters. Lastly, information on disaster and emergency response authorities is provided. For each disaster, an activity designed for students to implement the lessons they have learned in a real-time context by preparing their own emergency responses.

Objectives of the guidebook

1. To educate about climate disasters and appropriate actions during each phase.
2. To raise awareness on climate risks and preparedness.
3. To promote a sense of collective responsibility and action.

Anticipated Audience

Primarily targeting school children aged 14 -17, the guidebook aligns with the overarching objective of training communities on improving health and climate shock response. Each module is crafted to facilitate collective training sessions for students, ensuring their active participation and engagement.

Introduction to Disaster Risk Management

1. The guidebook begins with an introduction to disaster risk management, laying the foundation for understanding the importance of preparedness and response strategies within communities. Disaster responses are based on socio-ecological model, with focus on Individual level (How to save yourself) on household level (How to save your family) on community level in form of civic responsibility, (How to provide support to community).
2. Emphasis is placed on the context of rural and urban areas, acknowledging their unique challenges and vulnerabilities. The modules are flexible to accommodate existing tools and teaching aids that are used widely and are contextual to the community. Trainers are expected to augment the handbook with activities they find appropriate and, if need be, to use locally available resources and materials for any activity.

Disaster Risk Management

Disaster Risk Management (DRM) is a systematic approach to identifying, assessing, reducing, and managing the risks associated with disasters. It involves a series of coordinated actions and strategies aimed at enhancing the resilience of individuals, communities, and societies to natural hazards and other adverse events[1].
In a school-based context, Disaster Risk Management (SBDRM) involves preparing students, teachers, and staff to anticipate, respond to, and recover from disasters effectively. It is crucial to ensure the safety and well-being of everyone in the community. SBDRM revolves around four key components: Prevention, Preparedness, Response, and Recovery.[2]

1. Prevention

Prevention efforts focus on minimizing the risk of disasters occurring and reducing their potential impact. This includes raising awareness among community members about local hazards, such as heavy rainfall & flood, lightning, drought, heatwave, fire, earthquake, and smog and promoting sustainable practices and activities that mitigating climate change risks. In the context of Pakistan, there are a number of ways to mitigate the impacts of climate change, such as mangroves as they can store large amounts of carbon, thus contributing to global efforts to reduce greenhouse gas emissions, and support for biodiversity in coastal areas. For other terrains such as mountains, plateaus and plains, the combination of afforestation and agroforestry is vital for climate change mitigation. Agroforestry integrates local trees and shrubs into agricultural landscapes, combining agriculture with forestry, while afforestation involves planting trees in previously non-planted areas. These practices not only enhance climate resilience and mitigation efforts, but also provide resources such as timber, fuelwood, and non-timber forest products and enhance local livelihoods.

2. Preparedness

Preparedness is crucial for equipping communities with the knowledge, skills, and resources to respond effectively to disasters. This involves developing and practicing emergency response plans, identifying emergency safe locations, conducting drills and exercises, and stockpiling essential supplies, such as food, water, and medical supplies. Establishing early warning systems and communication networks can also help ensure timely alerts and coordination during emergencies.

3. Response

In the event of a disaster, response efforts focus on saving lives, protecting property, and providing immediate assistance to those in need. This may include evacuating residents to safe areas, providing first aid and medical care, and coordinating with local authorities and emergency services to mobilize resources and support relief efforts. Community-based organizations and volunteers often play a crucial role in response efforts, assisting with search and rescue operations and providing support to affected families.

4. Recovery

Following a disaster, recovery efforts aim to restore livelihoods, rebuild infrastructure, and promote long-term resilience. This includes assessing and addressing the needs of affected residents, repairing damaged homes and infrastructure, and implementing measures to reduce the risk of future disasters.

Figure 1: Disaster Management Cycle

HEAVY RAINFALL & FLOOD

Module 1:

How Higher Temperatures Cause Heavy Rainfall

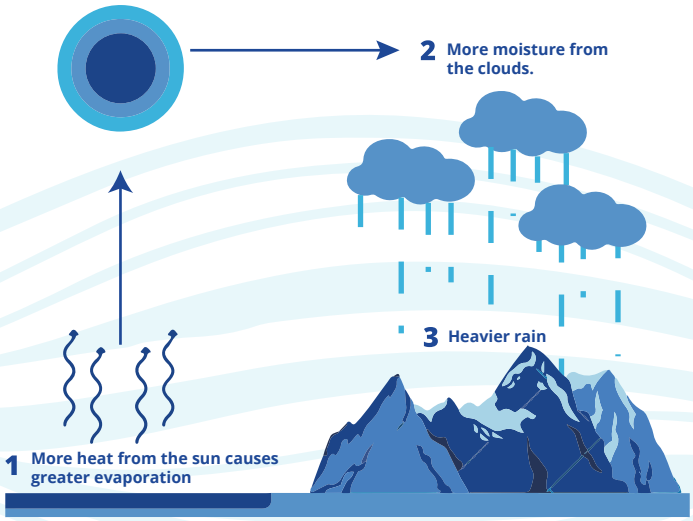


Figure 2: Rainwater cycle

Understanding Flood and the Rainwater Cycle

Flooding often results from heavy monsoon rains and the overflow of rivers like the Indus. The rainwater cycle in this region involves the evaporation of water from local water bodies, condensation into clouds, and precipitation as monsoon rains. During periods of intense or prolonged rainfall, rivers can overflow, causing widespread flooding. Additionally, rapid snow-melt from the northern regions can increase river flow, exacerbating the risk. The topography of Pakistan with range of valleys, riverbanks, mountains, low-lying areas and limited drainage infrastructure, contributes to the severity of floods. While flooding is a natural occurrence, human activities and climate change have intensified its impact, affecting agriculture, infrastructure, and communities across the country.

Heavy monsoon rains and increasing flood events in Pakistan are closely tied to the impacts of climate change, such as rising temperatures, which lead to greater snowmelt and more intense precipitation patterns, which increases the frequency and severity of floods.

Introduction

Heavy rainfall can lead to flooding, landslides, and other hazardous conditions, particularly in rural and urban areas of Pakistan. Understanding the risks associated with heavy rainfalls and implementing appropriate preparedness and response measures is crucial for safeguarding lives and property.

Children, women and elderly in flood-prone regions face significant risks including displacement, property damage, and disruption of essential services. Women and girls are especially at risk as they are unable to seek refuge due to restricted mobility. During heavy rainfalls and floods, unsafe water conditions and the spread of waterborne diseases, such as Dengue Fever and Malaria, further compound these challenges. The destruction of homes, infrastructure, and agricultural land exacerbates the impact, particularly in areas with limited resources. Special attention must be given to the mobility challenges faced by individuals with disabilities and the additional hazards risks to children and pregnant women. During both preparedness and recovery phases there should be discussion on trauma and stress that could arise from displacement or damage to property.

Actions Before Heavy Rainfall & Flood Emergencies (Preparedness)

1. Developing a family emergency plan by mapping out evacuation routes and identifying key communication strategies to keep in touch with family members.
2. Regular maintenance of gutters and drains is essential to prevent flooding. Remove debris such as leaves, branches to ensure proper water flow. Additionally, make sure that local drainage systems and water channels are free of blockages.
3. In preparation for potential emergencies, store important documents and valuables in waterproof containers to protect them from water damage.

4. Assemble an emergency kit that includes essential dry food items like dates, chickpeas, rusk, water, medications, sanitary pads or dignity kits, and a flashlight.
5. Stay informed by monitoring local weather updates and following the advice and alerts issued by local authorities.
6. To minimize health risks during floods, treat water by boiling, prevent standing water to reduce risks of Dengue, Malaria, and Diarrheal Diseases, maintain hygeine, store food in clean, dry containers above flood levels, discard contaminated food, wear protective clothing, and use mosquito nets.

Actions During Heavy Rainfall & Flood Emergencies (Response)

1. Move to higher ground or emergency shelters as directed by authorities. Avoid walking or driving through floodwaters due to hidden hazards and contamination.
2. Stay updated through local media and official channels for emergency instructions.
3. Help women and girls, the elderly or disabled, access necessary support services.
4. Look out for open drains and manholes, avoid falling in ditches.
5. Stay away from poles to avoid electrocution.
6. Avoid stagnant water around the house.
7. Drink clean and boiled water.

Actions After Heavy Rainfall & Flood Emergencies (Recovery)

1. Evaluate the extent of damage in affected areas. This includes inspecting residential properties, public infrastructure (roads, bridges, and utilities), and agricultural lands.
2. Work to quickly restore essential services that may have been disrupted due to flooding. This involves repairing power lines, ensuring clean water supply, and restoring sanitation facilities to prevent outbreaks of waterborne diseases.
3. Identify individuals requiring medical attention, particularly for injuries, illnesses, or chronic conditions exacerbated by the flooding.
4. Identify safe and adequate temporary housing options for individuals and families displaced by flooding. This may involve setting up emergency shelters, or facilitating community housing solutions.
5. Organize community clean-up efforts to remove debris, contaminated materials, and stagnant water that can pose health risks.

Activity 1: Design A Flood-resilient Community And Vulnerability Exercise

Objective:

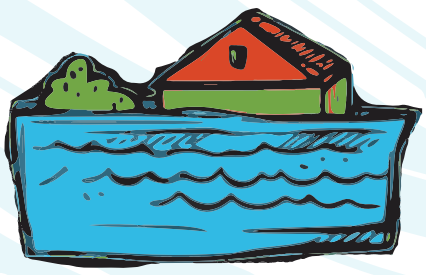
To engage students in critical thinking about strategies for building resilience to flooding in their community and to highlight civic responsibility.

Instructions:

1. Divide the students into small groups.
2. Provide each group with information about flood-resilient infrastructure and community planning measures, such as elevated homes, flood barriers, and evacuation plans.
3. Discuss the importance of evacuating vulnerable populations, including children, pregnant women, individuals with disabilities, and the elderly and how to prioritize their safety.
4. Task the groups with designing a flood-resilient community layout. Encourage them to consider factors such as land use, infrastructure, and environmental sustainability.
5. Include a focus on emergency preparedness, such as what to take during a flood (e.g., sanitary pads/dignity kits, emergency torch, dry fruits, and essential documents).
6. Have each group present their flood-resilient community design to the class. Each group should explain their design choices, the rationale behind them, and how they address specific challenges faced by their community.

Reflection Questions:

1. What innovative solutions did your group propose to enhance flood resilience in your community?
2. How did your community design prioritize the safety and well-being of its residents, particularly vulnerable groups?
3. What role can local government and community organizations play in implementing and supporting flood-resilient measures?



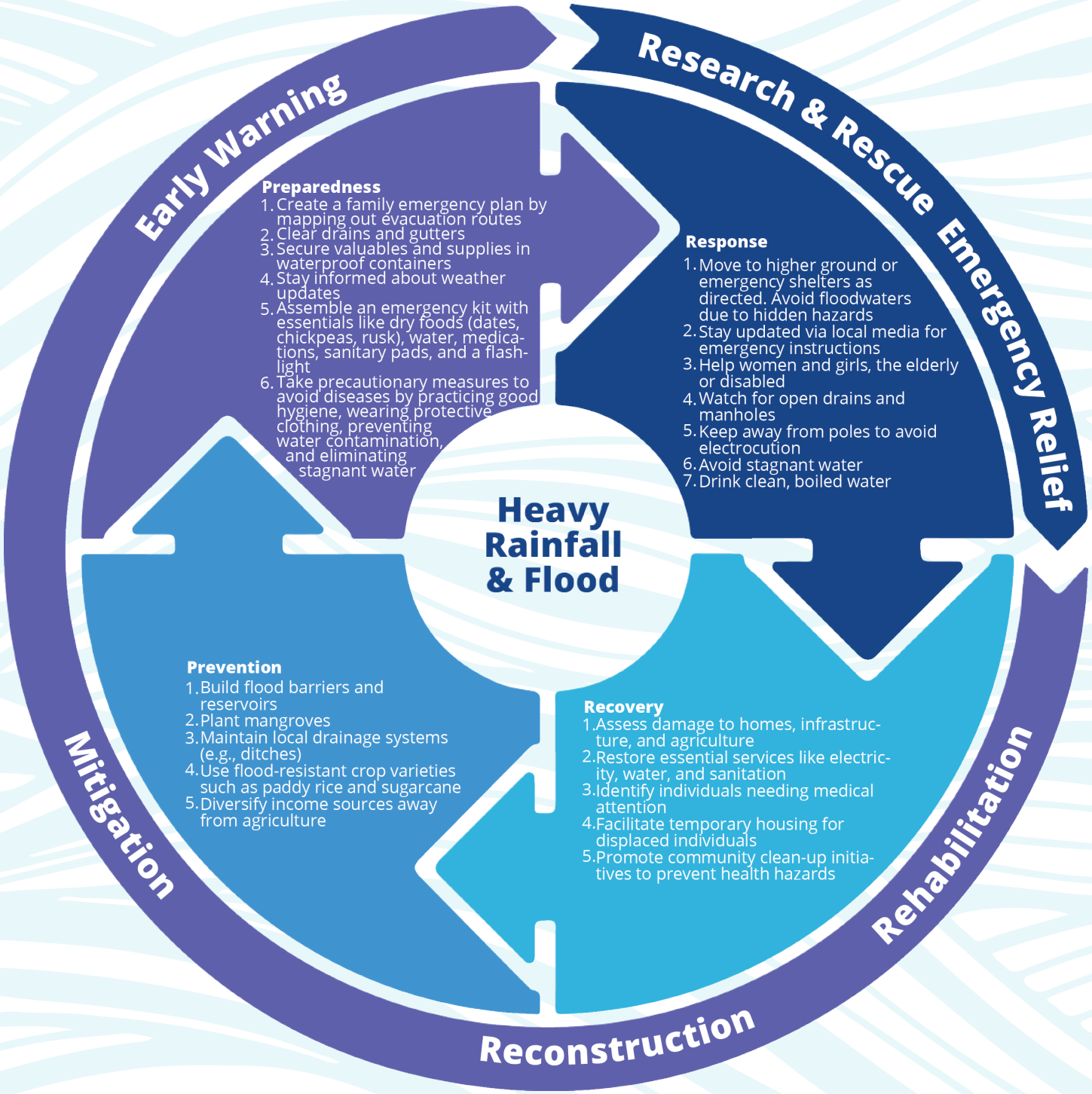
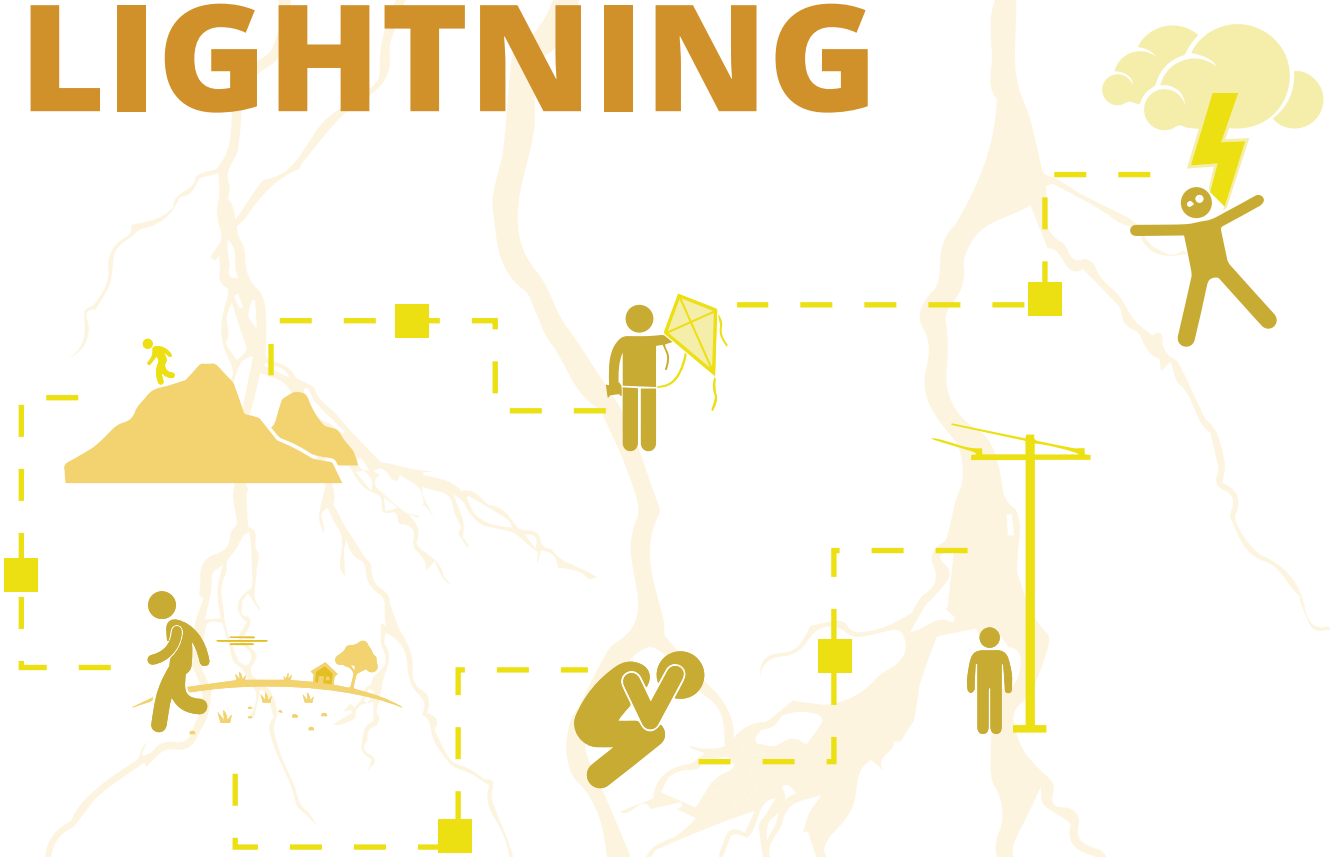


Figure 3: Disaster Management Cycle for Heavy Rainfall & Flood

LIGHTNING



Module 2:

Introduction

Lightning is a powerful electrical discharge during thunderstorms. In rural areas of Sindh and Khyber Pakhtunkhwa (KPK), lightning strikes cause serious damage, including loss of life and livestock. Recent studies reveal that the region experiences an estimated annual average of 100,000 lightning strikes, significantly higher than the global average of 25,000[3] . This increased frequency is attributed to the region's unique environmental and geographic characteristics.

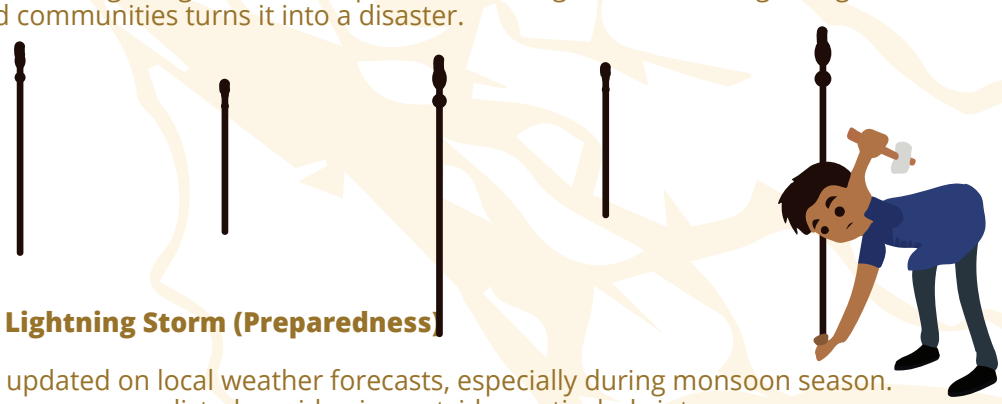
Climate change has been shown to lead to more intense thunderstorms, driven by rising temperatures and altered weather patterns. As global temperatures increase, the atmosphere holds more moisture, creating conditions leading to severe storms resulting in higher incidence of heavy rainfall events, which can trigger thunderstorms and, subsequently, lightning strikes.

Lightning strikes can cause significant emotional distress for communities, particularly for those who have experienced loss, such as injuries or fatalities among family members or livestock. The impact of these traumatic events extends beyond the immediate physical dangers, often leaving survivors and witnesses grappling with feelings of grief, anxiety, and fear.

During a lightning storm, support systems for vulnerable groups become even more critical. Elderly individuals and those with mobility challenges require additional assistance to quickly find safe shelter. Children are particularly vulnerable as they often play in ditches or low-lying areas after storms, unaware of the potential dangers associated with such locations.

Hazard vs Disaster

A hazard refers to the potential danger posed by lightning strikes, which can cause harm due to electrical discharge. However, when lightning leads to actual harm, such as casualties, livestock losses, and property damage, it transforms from a mere hazard into a disaster. This occurs when the lightning hazard interacts with communities, resulting in significant disruption and damage. Thus, while lightning itself is a hazard, its impact on affected communities turns it into a disaster.



Actions Before a Lightning Storm (Preparedness)

1. Always stay updated on local weather forecasts, especially during monsoon season.
2. If thunderstorms are predicted, avoid going outside, particularly into open areas.
3. Identify safe buildings nearby, such as brick houses or concrete shelters.
4. Avoid sheltering under trees or open structures, as these attract lightning.
5. If possible, move livestock into sheltered areas and remove metal objects and tools from open spaces.

Actions During a Lightning Storm (Response)

If Indoors: Stay inside, away from windows and doors. Do not touch electrical appliances or metal objects. Stay off wired phones and avoid taking showers or washing dishes, as water conducts electricity.

If Outdoors: Move to a low-lying area away from trees, open fields, or tall structures. If there's no shelter nearby, crouch with your feet together and hands covering your ears to reduce the risk of being struck. Stay away from rivers, ponds, or puddles, as water is a good conductor of electricity. Avoid farm equipment, bicycles, and any other metal objects that can attract lightning.

Actions After Lightning Storm (Recovery)

1. Inspect your property for any damage to structures, trees, or electrical systems.
2. Ensure all family members are safe and seek medical attention for any injuries.
3. Report any damaged power lines or utility issues to the appropriate services.
4. Avoid contact with bodies of water as they may still pose a risk.
5. Keep informed about further weather updates or warnings in your area.

Activity 2: Lightning Risk Awareness and Evacuation

Objective:
Teach students to recognize safe areas and practice essential thunderstorm safety actions through a role-playing drill.

Instructions

Split students into small groups and ask them to identify safe and unsafe areas in their village (e.g., fields, livestock shelters, trees, concrete buildings). Conduct a role-playing drill where students practice seeking shelter during a mock thunderstorm. Encourage students to practice moving livestock or covering metal objects and demonstrate crouching in the open when no shelter is available.

Reflection Questions

1. Discuss the challenges they faced during the drill and how they can improve their response.
2. Emphasize the importance of staying safe during lightning storms and how proactive steps can reduce risks.

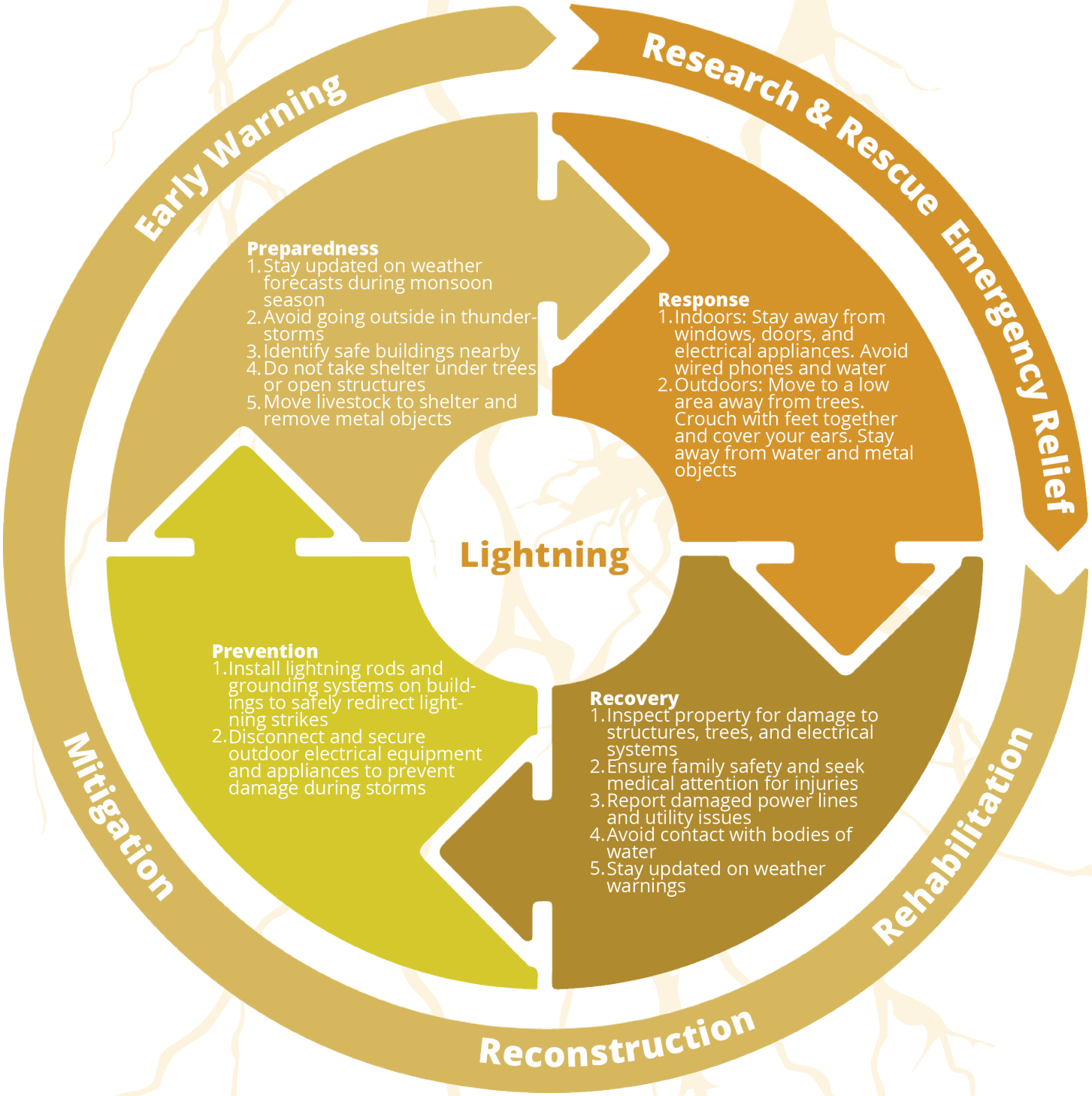
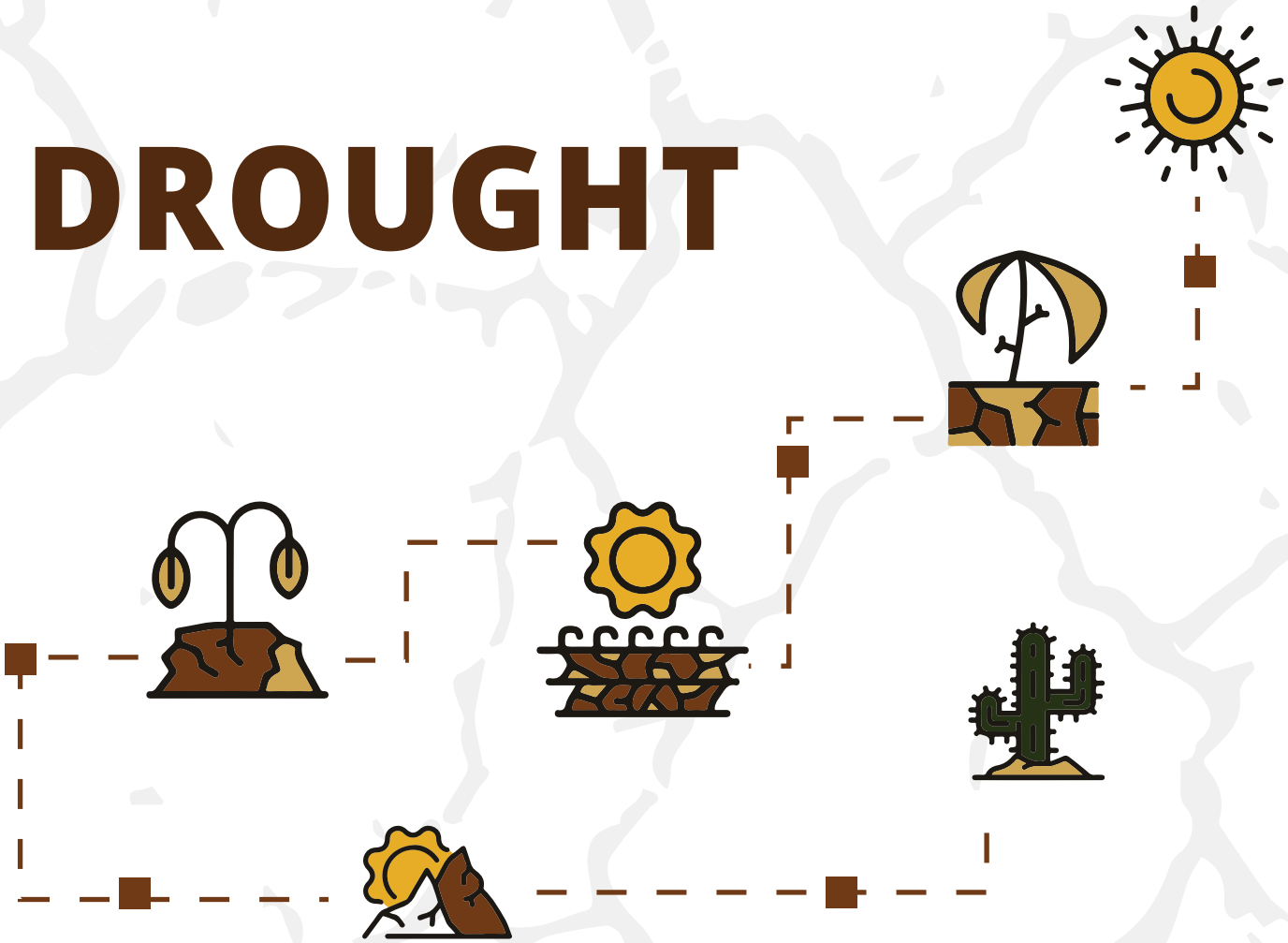


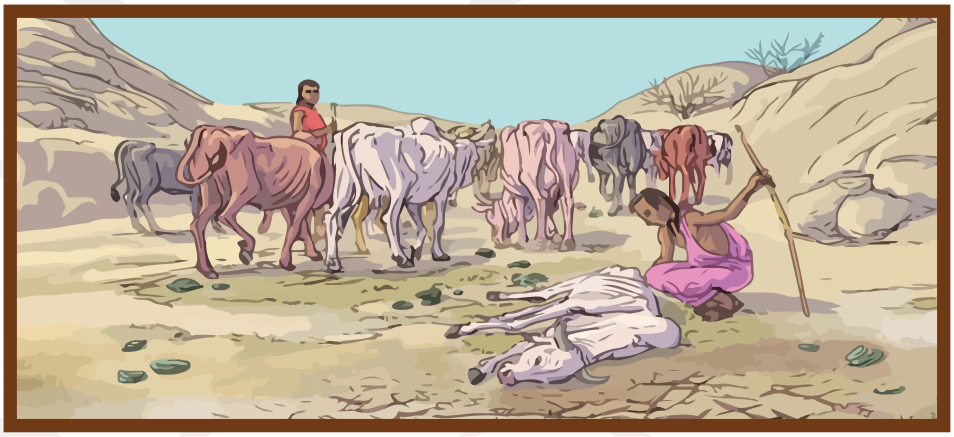
Figure 4: Disaster Management Cycle for Lightning

DROUGHT



Module 3:

Activity 3: Navigating Drought Impacts – Cross the Line



Source: Pathfinder International, Tanzania

Objective:

To explore personal experiences and perceptions of drought impacts by understanding how climate change affects different groups and discuss local adaptation strategies.

Instructions:

1. Show the provided picture of a drought-prone area to the participants without any explanation.
2. Create a line on the floor.
3. Have all participants stand on one side of the line.
4. Begin the game.
5. Read questions starting with "Cross the line if..."
6. Participants should step across the line if the statement applies to them and stay on the starting side if it does not. Pause to let participants observe who is standing with them before they return to the starting point.

Questions: Cross the line if...

1. You have seen drought or water shortages in your district.
2. You believe that drought has impacted your family's livelihood.
3. Women in your district are disproportionately affected by climate change.
4. Men in your district are leaving for work due to climate-related issues.
5. Children in your district miss school because of climate-related problems.
6. You are aware of climate change and its effects.
7. There is a plan in your district to deal with climate change.

Reflection Questions:

1. After the game, gather everyone for a discussion.
2. Ask participants to share their reflections on the activity and the picture shown earlier.
3. Discuss key observations, focusing on how drought and climate change impact women, men, and children differently.
4. Summarize the lessons learned and brainstorm possible solutions for local adaptation strategies.

Introduction

Droughts are increasingly linked to climate change, with rising global temperatures and shifting precipitation patterns exacerbating their frequency, intensity, and duration. As the climate warms, the atmosphere can hold more moisture, which can lead to altered rainfall patterns. Regions that previously experienced consistent rainfall may face prolonged dry spells. In rural and semi-rural areas of Pakistan, droughts can have severe consequences for agriculture, livestock, livelihoods, and access to clean water.

Children and vulnerable communities especially women and girls in drought-prone regions face multiple challenges, including food insecurity, malnutrition, and economic hardships. As water collection is traditionally a feminized task, the responsibility for fetching water falls on women in households, an endeavor that becomes increasingly challenging in the face of climate calamities[4] . At the same time caring for their families, looking after household chores and then managing outside tasks increases the burden on women. Limited access to clean water and sanitation facilities further exacerbates health risks.

Actions Before a Drought Emergency (Preparedness)

1. Identify areas and people most vulnerable to drought by considering factors such as water availability, agricultural reliance, and socio-economic conditions to prioritize resources and provide support.
2. Regularly assess the status of water resources, including local reservoirs, groundwater levels, and rainfall patterns and save water in tanks and buckets for drinking and essential domestic purposes.
3. Preserve food by solar drying meat, fruits, and vegetables, and keep dried food items for later use. Raise awareness about the importance of drought preparedness and water conservation.

Actions During a Drought Emergency (Response)

1. Implement strict water conservation measures and allocate water to ensure availability for essential needs during the drought.
2. Support efforts such as food distribution and livestock assistance to help families cope with food shortages and protect their livelihoods.
3. Raise awareness about proper hygiene practices, to prevent health issues. Encourage minimal water use for hygiene purposes while ensuring cleanliness.

Actions After a Drought Emergency (Recovery)

1. Evaluate the drought's impact on water resources, agriculture, and community well-being.
2. Reuse water from sinks, showers and laundry for irrigation.
3. Participate in community food aid programs and support local food production.

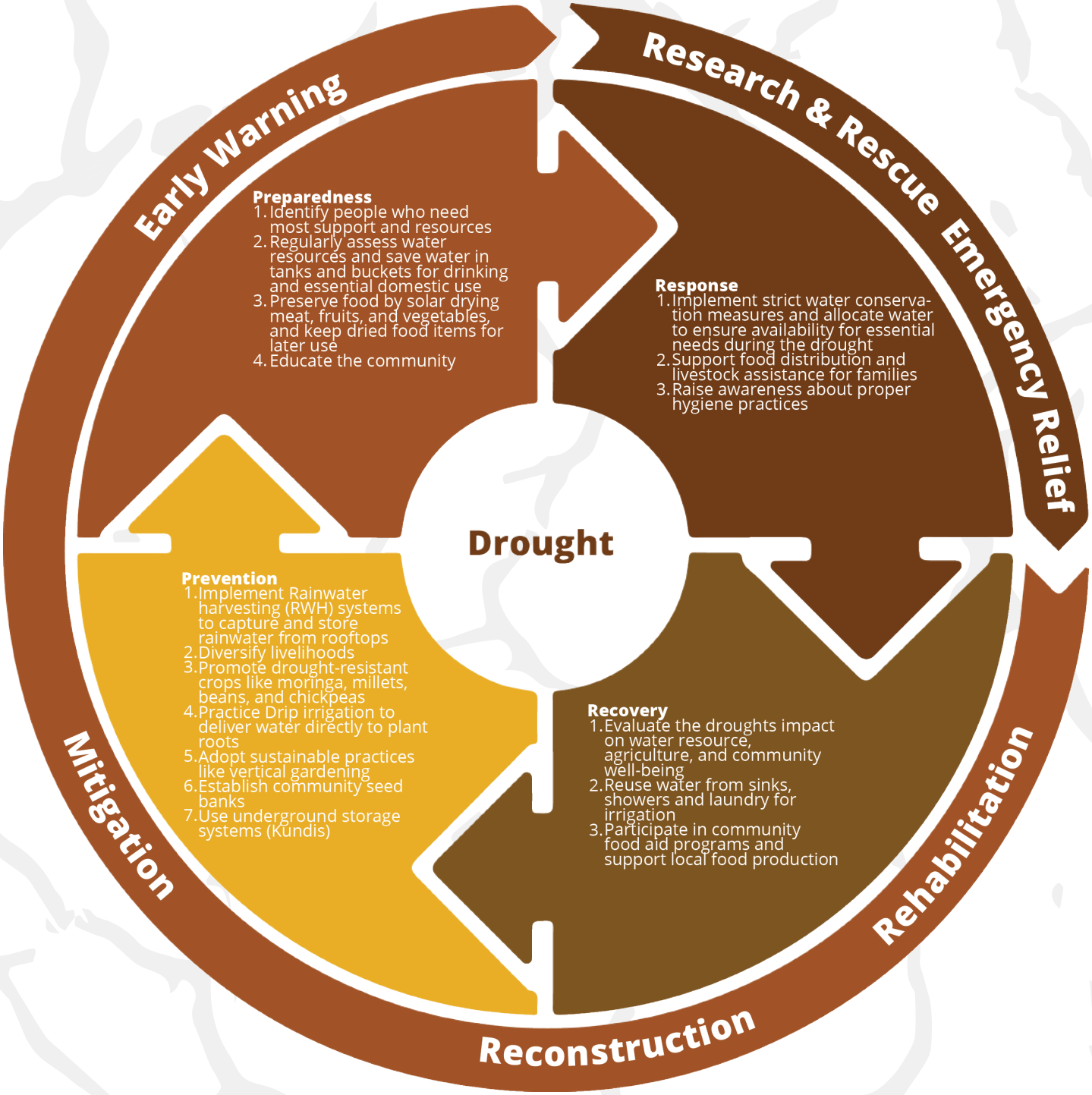
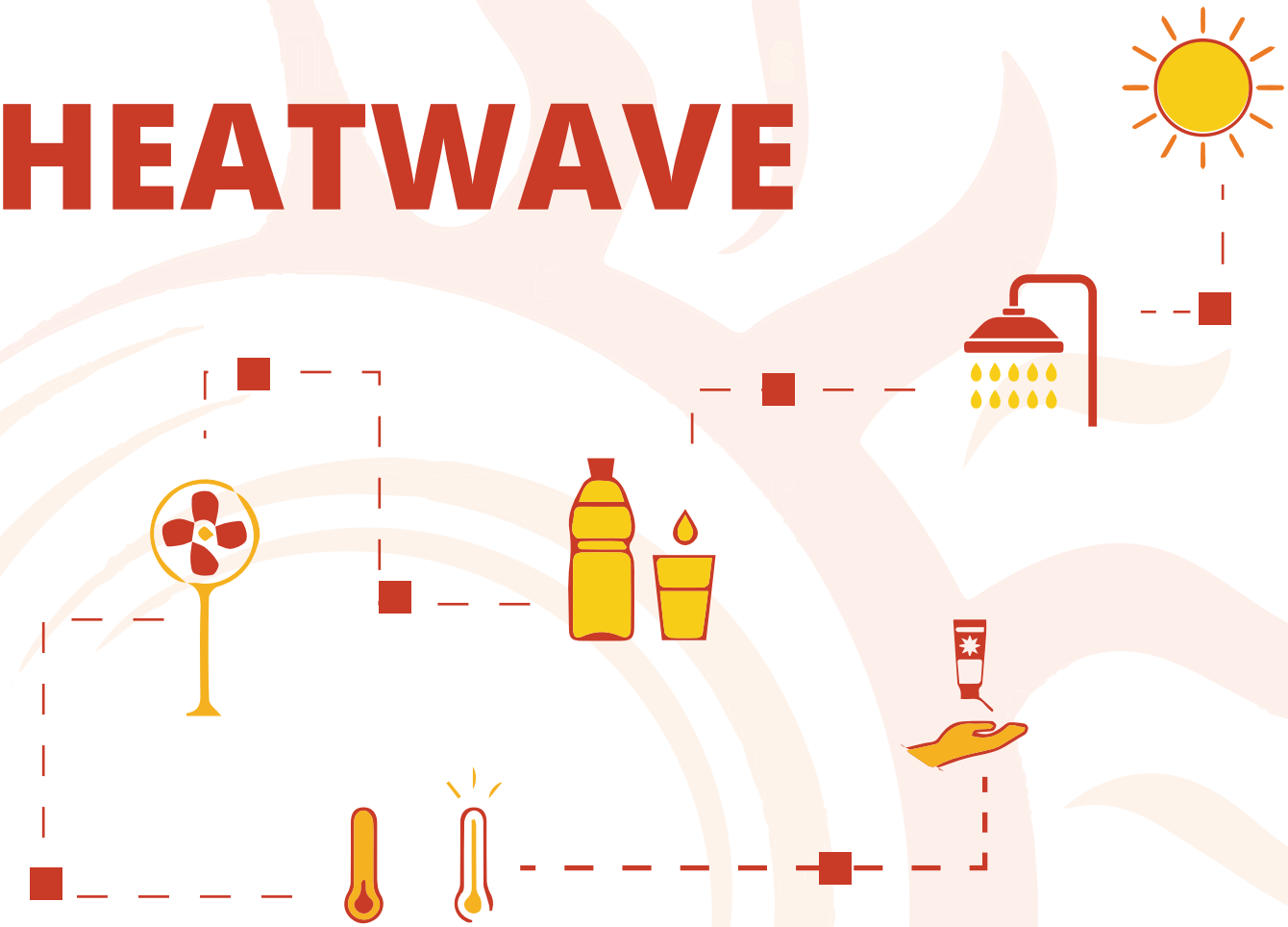


Figure 5: Disaster Management Cycle for Drought

HEATWAVE



Module 4:

Introduction

Climate change is driving more frequent and intense heatwaves, as global temperatures continue to rise. Pakistan ranks fifth (global climate index)[5] among the world's most vulnerable countries, with its southern province of Sindh identified as one of South Asia's focal points for climate change[6]. Heatwaves are prolonged periods of excessively hot weather, posing serious health risks, especially in rural and urban areas of Pakistan.

Children, pregnant and lactating women, along with the elderly and those with pre-existing health conditions, are particularly vulnerable during heatwaves[7]. During heatwaves, the risk of heat-related illnesses such as heatstroke, dehydration, and heat exhaustion increases[8] . Vulnerable individuals may face challenges in regulating their body temperature, leading to heightened vulnerability. Additionally, rural, and semi-rural communities often lack access to adequate shelter, clean water, and healthcare facilities, exacerbating the risks.

Activity 4: Build Your Heatwave Emergency Preparedness Kit

Objective:

To teach students how to identify essential items for a heatwave emergency kit, improve decision-making and teamwork skills, and explore strategies for enhancing community resilience during heatwaves.

Instructions:

1. Split the students into small groups, ensuring each group has a mix of participants to encourage teamwork and discussion.
2. Provide each group with a set of pictures representing various items, some of which are essential for a heatwave emergency kit (e.g., bottled water, electrolyte drinks, hats, lightweight clothing) and some that are irrelevant or even harmful in a heatwave situation (e.g., heavy blankets, sugary drinks, chocolate, electronic devices without cooling, etc.). Ask the groups to select the most appropriate items from the pictures to include in their heatwave emergency kit. Encourage them to discuss among themselves to reach a consensus on which items are necessary and why.

Reflection Questions:

1. What challenges did you encounter while planning your heatwave emergency kit?
2. How did your group prioritize which items to include in the kit?
3. What additional measures could be taken to ensure community resilience during a heatwave?

Actions Before Heatwave Emergency (Preparedness)

1. Check forecasts and warnings regularly.
2. Seek shelter in shaded areas to stay cool.
3. Have water, oral rehydration salt (ORS) packets, a thermometer, and towels or cloths ready for cooling.
4. Limit outdoor activities.
5. Ensure elderly, infants, pregnant and lactating women are safe and hydrated.

Actions During Heatwave Emergency (Response)

1. Stay hydrated by drinking plenty of water and avoid eating spicy food.
2. Avoid outdoor activities, especially during peak heat hours.
3. Wear loose, light-coloured clothing and use an umbrella or hat when going outside.
4. Seek shade if you start feeling overheated.
5. Recognize heat-related symptoms:
   1) Heat Exhaustion: Heavy sweating, weakness, dizziness, nausea, and headache.
   2) Heatstroke: High body temperature (above 103°F), confusion, rapid pulse, and loss of consciousness.
   3) Heat Cramps: Muscle pain or spasms, usually in legs or abdomen.
6. Cool off with wet cloth, seek medical help if necessary.

Actions After Heatwave Emergency (Recovery)

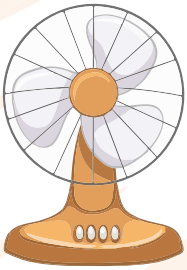
1. Check on elders, children, pregnant and breastfeeding women, and pets to ensure their well-being.
2. Monitor health for lingering symptoms and seek medical attention if needed.
3. Take time for self-care to feel better and reduce fatigue.
4. Continue to stay hydrated by drinking water.

Keep yourself hydrated at all times

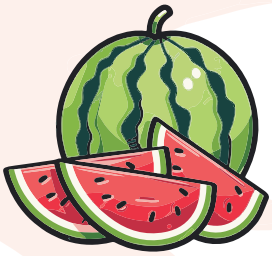
Wear light weight loose fitted clothes

Avoid hot beverages and spicy food

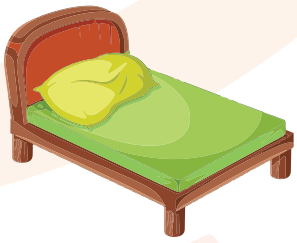
Take regular cool showers



Use fans to stay cool



Eat cold and hydrating foods



Make sure to get enough rest

Utilize shade

Figure 6: Tips to Beat the Heat

Figure 7: Disaster Management Cycle for Heatwave

FIRE

Module 5:

Introduction

While wildfires are not a common occurrence in Pakistan, extreme heatwaves can still trigger bushfires. The combination of prolonged heat and dry conditions increases the risk of fire incidents. High temperatures can easily ignite dry vegetation, and glass bottles left in direct sunlight can act like magnifying glasses, starting fires. Kitchens located near homes or open flames outside can also pose fire hazards. Fires can start for various reasons, including unattended cooking, electrical faults, open flames, or improper storage of flammable materials. In rural areas, dry conditions and the use of traditional stoves further increase fire risks. Whereas bush houses made of wood, straw, and other flammable materials catch fire quickly. Strong winds can further spread the fire to nearby homes or fields, creating a dangerous situation.
The impacts of fires extend beyond immediate destruction, they can lead to significant air quality issues and health problems. Vulnerable populations, including those with respiratory conditions and the elderly, may face heightened health risks due to smoke inhalation and exposure to extreme heat.

Actions Before a Fire (Preparedness)

1. Keep flammable materials away from the kitchen, especially when cooking with open flames or stoves.
2. Avoid leaving glass bottles, mirrors, or flammable objects in direct sunlight.
3. Store dry vegetation away from kitchen to prevent bushfires from spreading.
4. Store matches, lighters, and other fire-starting materials out of children's reach.
5. Identify two safe exit routes from your home and ensure all family members, especially children, know how to evacuate quickly in case of fire.

Actions During a Fire (Response)

If Indoors: Crawl on the ground to avoid smoke inhalation and don't open windows as this can feed the fire with oxygen. If a door feels hot, do not open it. Look for another exit. Cover your nose and mouth with a wet cloth to filter smoke.

If Outdoors: Move away from the fire as quickly as possible, avoid breathing in smoke. In case your clothes catch fire, use the "Stop, Drop, and Roll" technique to put it out.

Actions After a Fire (Recovery)

1. Do not re-enter the building until it is safe.
2. Get checked for smoke inhalation or injuries.
3. Notify local authorities to assess fire damage and risks.
4. Arrange temporary housing if your home is uninhabitable.

Activity 5: Fire Prevention Awareness Exercise

Objective:
Train students to identify fire hazards and practice safe evacuation techniques through a hands-on drill

Instructions:

1. Organize a group activity where students identify potential fire hazards in a typical rural home setting (e.g., glass bottles, bush houses, kitchen setups).
2. Ask them to suggest ways to reduce these risks (e.g., moving glass bottles out of direct sunlight, creating safe kitchen spaces away from homes).
3. Practice an evacuation drill where students must safely exit a simulated fire in the house, crawling on the ground and reaching the designated safe area.

Reflection Questions:

1. Discuss how heatwaves and the rural environment make certain areas more prone to fire hazards.
2. Emphasize the importance of staying calm and acting quickly in case of fire, and how good planning can save lives.

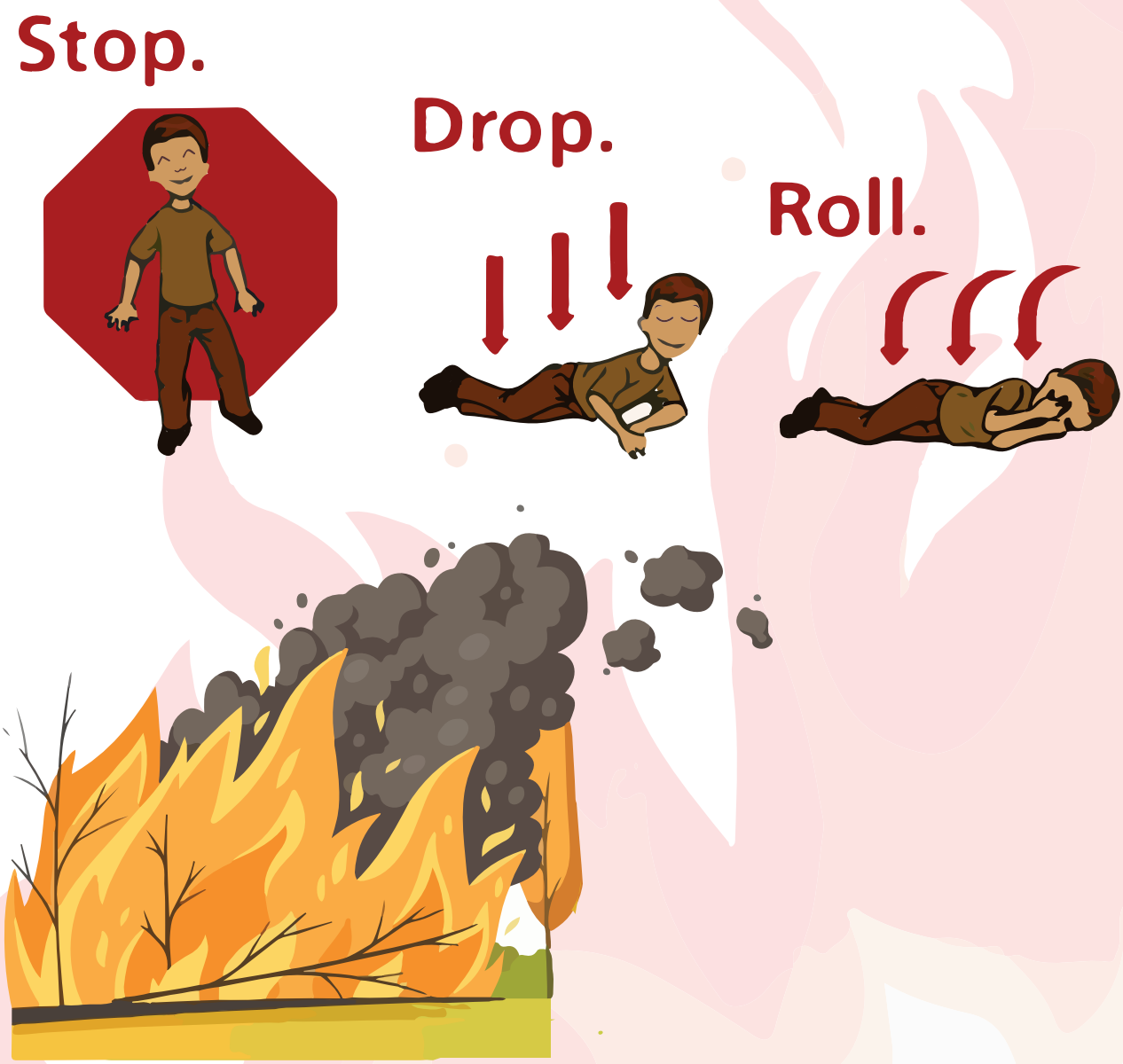
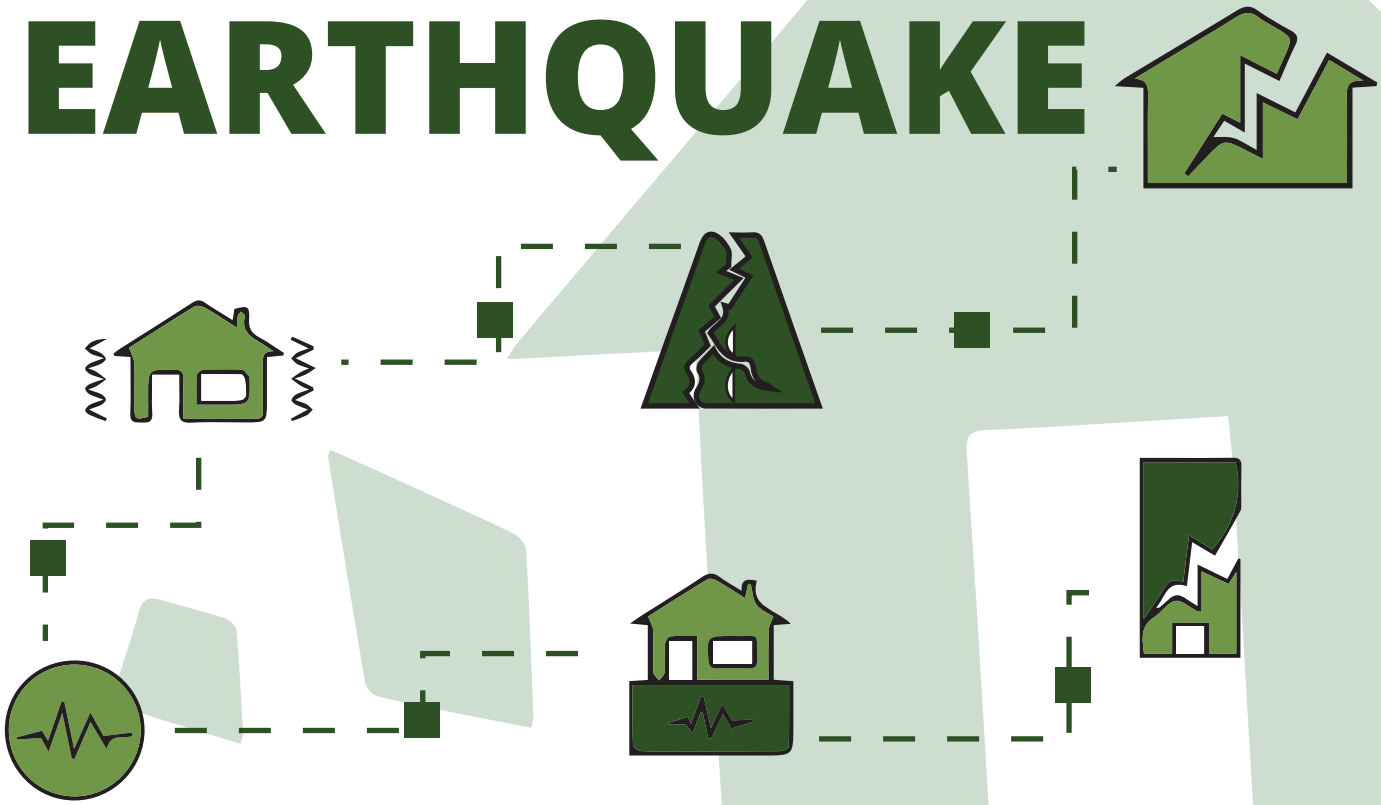
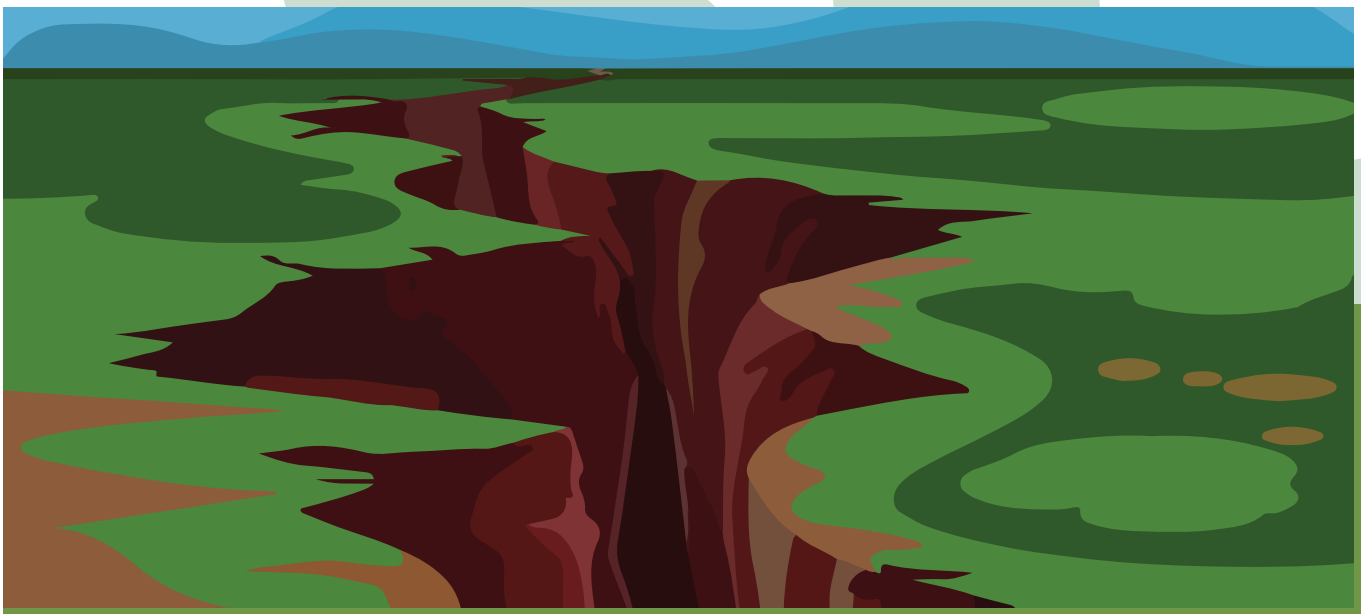


Figure 8: Disaster Management Cycle for Fire

EARTHQUAKE





Module 6:

Introduction

Earthquakes are natural phenomena that can lead to significant destruction, especially in areas with inadequate infrastructure. Earthquakes occur due to the movement of tectonic plates, but climate change can influence related factors, such as increased rainfall and flooding that can destabilize slopes and contribute to landslides during seismic events.

Pakistan is situated in a seismically active region, primarily due to its location at the convergence of the Indian and Eurasian tectonic plates. This geographical positioning makes the country particularly vulnerable to earthquakes, particularly in the region of Islamabad and Khyber Pakhtunkhwa (KPK) province, which has a history of seismic activity. While earthquakes are not as common in Sindh certain areas, do occasionally experience them due to their proximity to the Arabian Sea[9].

During earthquakes, certain groups, such as children, the elderly, pregnant women, and people with disabilities, are particularly vulnerable due to physical limitations, reduced mobility, and specific care needs[10]. Individuals and communities affected by earthquakes may experience trauma, anxiety, and stress. They can cope by seeking support from family and friends, engaging in physical activities, and participating in community recovery efforts.

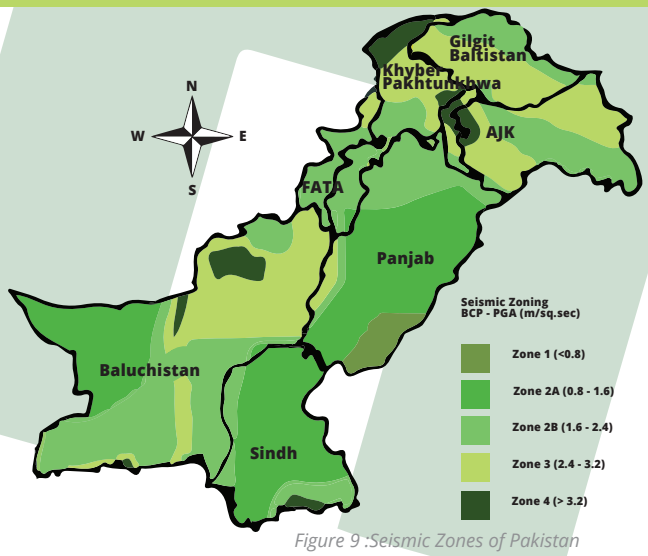


Figure 9 :Seismic Zones of Pakistan

Actions Before Earthquake Emergency (Preparedness)

1. Create a family communication plan outlining meeting places and contact information, ensuring all members are aware of their roles.
2. Identify potential hazards in your home and community, assessing structural vulnerabilities and making necessary improvements.
3. Assemble a disaster supply kit with essentials like water, dry food items like (dates, chickpeas and rusk) first aid supplies, flashlights, batteries, and important documents.
4. Designate safe spots in each room, such as under sturdy furniture or against interior walls, away from windows.

Actions During Earthquake Emergency (Response)

During an earthquake, the immediate response is critical.

If Indoors: The Drop, Cover, and Hold On" technique, which is recommended by emergency management organizations is an effective method to cope during an earthquake[11]. This method involves dropping to the ground, taking cover under a sturdy piece of furniture, and holding on until the shaking stops.

If outdoors: Move to an open area away from buildings, trees, and electrical lines. Sit or kneel to avoid falling.

Actions After Earthquake Emergency (Recovery)

1. Assess yourself and others for injuries. Provide first aid if necessary and seek medical help for serious injuries.
2. If your building is damaged or unsafe, evacuate to a safe location away from potential hazards.
3. Check on neighbours, especially those who may need assistance, such as the elderly or disabled.
4. Stay alert for aftershocks, which may occur after the initial earthquake, and be ready to drop, cover, and hold on again.
5. Seek mental health support if needed, as aftershocks and trauma can affect emotional well-being.

Activity 6: Earthquake Preparedness Response

Objective:

To help students practice earthquake response and enhance preparedness.

Instructions:

1. Divide the class into small groups and assign each group a location (indoors, outdoors, in a crowded space).
2. Each group will simulate being in their assigned location when an earthquake occurs.
3. Students will practice the "Drop, Cover, and Hold On" technique or move to a safe area if inside.
4. Discuss how their surroundings impacted their response and what they learned.

Reflection Questions:

1. Ask students to share what they found most difficult about the drill and how they could improve their response.

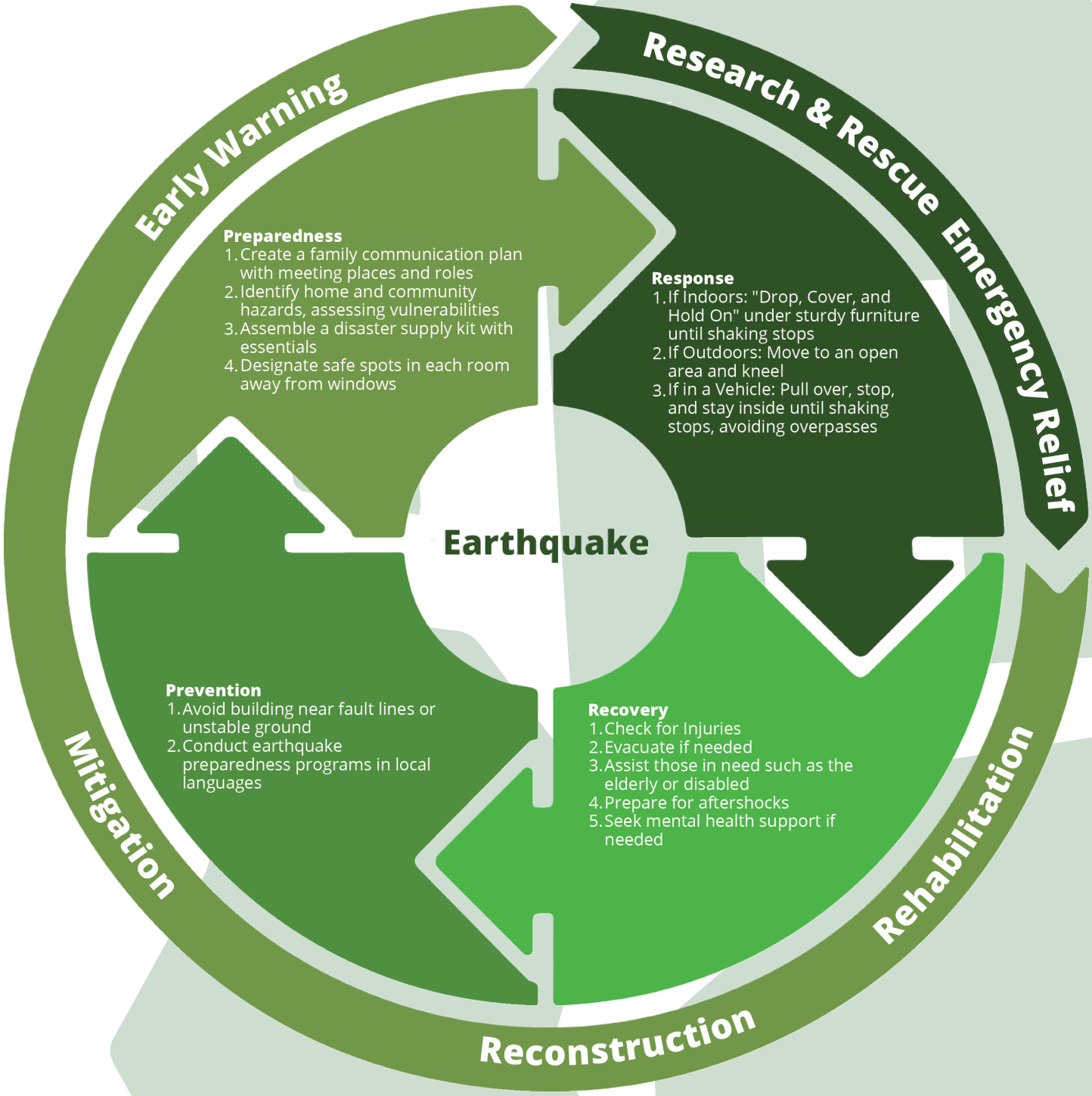
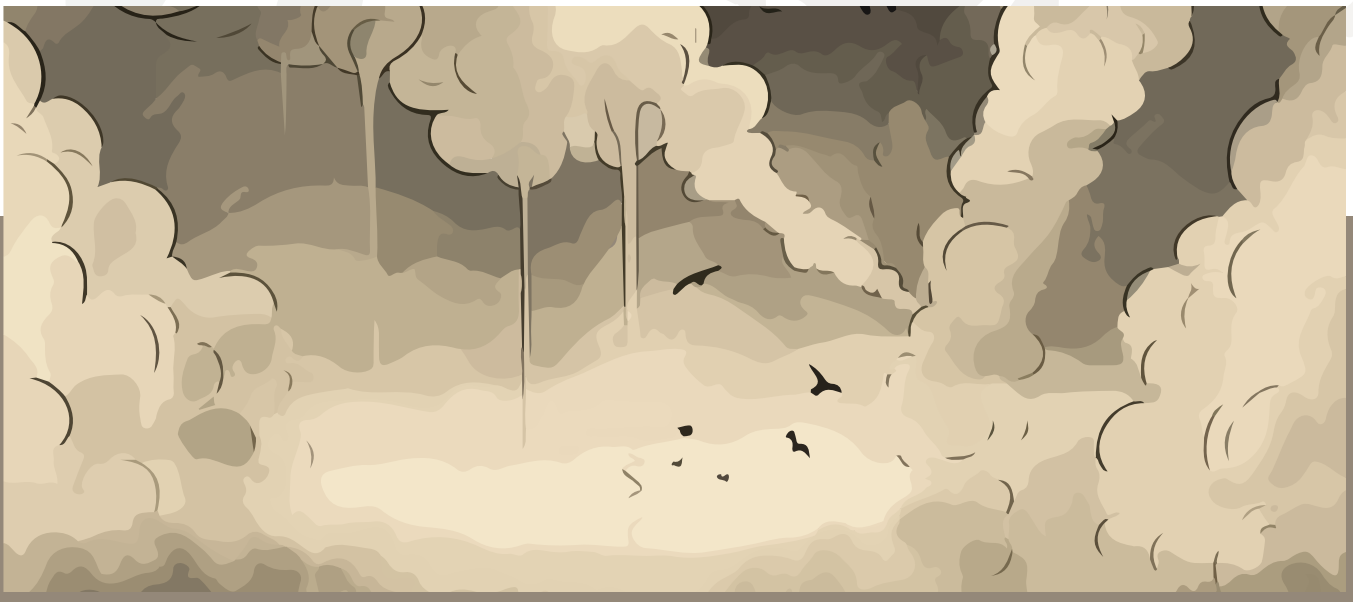


Figure 10: Disaster Management Cycle for Earthquake

SMOG



Module 7:

Introduction

Smog is a type of air pollution that appears as a thick, foggy cloud in the air. It forms when smoke from vehicles, factories, and burning fields mixes with fog and dust. Rising temperatures, changing weather patterns, and increased air pollution from activities such as deforestation and the burning of fossil fuels contribute to the formation of smog.

In winter, smog forms when warm air traps cooler air near the ground, preventing it from rising. This creates a situation where pollutants from vehicles, heating, and industry remain close to the surface instead of dispersing, leading to poor air quality. Pakistan is highly susceptible to smog, and every year the upper and central parts of the country experience intense smog. In 2023, Pakistan's air quality was 14.7 times more than the WHO annual air quality guideline value[12]. Smog is especially common in large cities, areas near industries, heavy traffic, and adjacent rural areas.

It contains tiny particles and gases that can cause breathing problems, make eyes water, and harm people with asthma or other respiratory conditions. Long-term exposure can lead to serious health issues and causes visibility barriers on roads, leading to traffic accidents. Children, elderly people, and those with respiratory diseases are particularly vulnerable.

Actions Before a Smog (Preparedness)

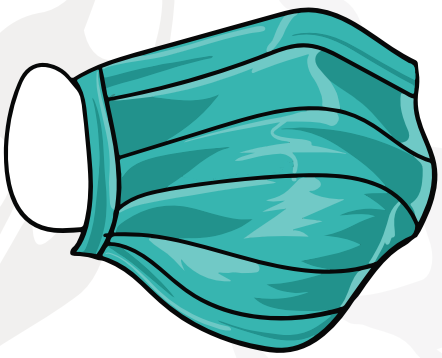
1. Listen to radio announcements or check with school authorities if it is safe to go outside on days with heavy smog.
2. Use masks when going outside to avoid breathing harmful particles.
3. Close windows and doors to prevent smog from entering homes and classrooms.

Actions During a Smog (Response)

1. Avoid playing outside or engaging in sports on smoggy days.
2. If outside on smoggy days, avoid stopping in the middle of the road to prevent accidents.
3. If someone has difficulty breathing, help them sit down, stay calm, and seek medical help if symptoms worsen.

Actions After a Smog (Recovery)

1. After a smog event, check for any health issues like a cough or sore throat and report them to parents or teachers.
2. Drink plenty of water to help clear any pollutants from the body.



Activity 7 : Smog Fact Matching Exercise

Objective:
To help students learn about the causes, effects, and prevention of smog through an interactive matching exercise.

Instructions:

Divide students into pairs or small groups.
Provide each group with a set of fact and explanation cards and ask them to work together to match each fact with its corresponding explanation or impact.

Facts:

1.Smog is a mixture of fog and smoke.
2.Smog can cause breathing problems and harm people with asthma.
3.Smog forms more often during the winter due to temperature inversion.
4.Burning fossil fuels, like coal and oil, contribute to smog.
5.Trees help reduce smog by cleaning the air.
6.Smog can cause accidents due to poor visibility.

Explanations:

1. Smog forms when smoke from vehicles, factories, and burning materials mixes with fog, creating a thick, hazy cloud.
2. Smog irritates the lungs, making it hard to breathe and worsening conditions like asthma.
3. In winter, warm air traps cooler air near the ground, preventing pollution from dispersing and increasing smog.
4. Burning fossil fuels like coal, oil, and gas releases pollutants into the air, contributing to smog.
5. Trees absorb pollutants from the air, helping to improve air quality and reduce smog.
6. The haze from smog reduces visibility on roads, which can lead to more traffic accidents.

Reflection Questions:

1. What was the most surprising fact you learned about smog?
2. How can sharing what we learned about smog help others in our community stay healthy?

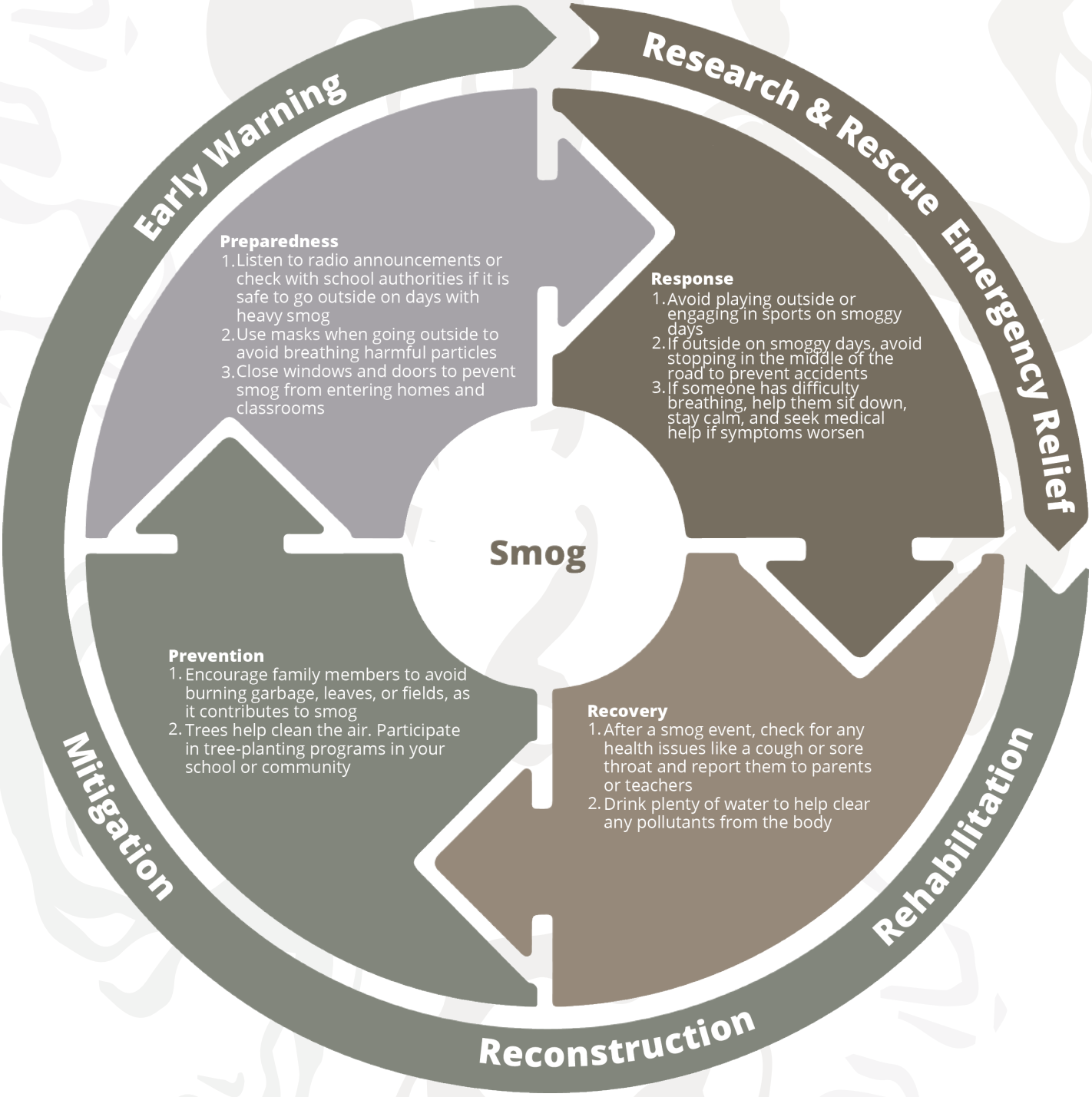


Figure 11: Disaster Management Cycle for Smog

Module 8: Measures to Mitigate Climate Risk

Introduction

As climate-related disasters become increasingly frequent and severe, communities must adopt sustainable practices to mitigate their impact. This section outlines effective strategies for reducing the risks associated with climate disasters. These mitigation measures emphasize locally appropriate, environmentally friendly, and sustainable approaches that can be adapted to diverse settings. The goal is to empower communities to strengthen resilience, safeguard livelihoods, and minimize damage while promoting long-term environmental stewardship.

Prevention through Mitigation Strategies

1.HEAVY RAINFALL & FLOOD

Sustainable Practices

1. Build flood barriers and reservoirs for flood management.
2. Encourage nature-based solutions such as mangroves to act as natural buffers.
3. Develop and maintain local drainage systems, such as ditches, to efficiently channel rainwater away from homes and agricultural land.
4. Promote the use of flood-resistant crop varieties such as paddy rice and sugarcane.
5. Diversify income sources to reduce dependence on agriculture that may be affected by flooding.

2.LIGHTNING

Sustainable Practices

1. Install lightning rods and grounding systems on buildings to safely redirect lightning strikes.
2. Disconnect and secure outdoor electrical equipment and appliances to prevent damage during storms.

3.DROUGHT

Sustainable Practices

1. Implement rainwater harvesting (RWH) systems by capturing and store rainwater from rooftops and surfaces, helping to alleviate water shortages, especially in dry seasons.
2. Diversify livelihood to reduce financial dependence.
3. Promote drought-resistant crops such as moringa, millets, beans, and chickpeas.
4. Practice drip irrigation, which delivers water directly to the plant roots, minimizes evaporation and runoff, making it an efficient method for water conservation.
5. Adopt sustainable practices such as vertical gardening.
7. Develop community seed banks.
8. Establish local water reservoirs such as underground water storage systems (Kundis).

4.HEATWAVE

Sustainable Practices

1. Paint roofs and sun-facing walls with reflective locally acquired materials such as chalks.
2. Encourage use of solar plates.
3. Plant more trees.
4. Encourage the use of public transport and bicycles to reduce carbon emissions.

5.FIRE

Sustainable Practices

1. Avoid practice of burning fields after cultivation (stubble burning).
2. Ensure access to an emergency water supply, such as water tanks or nearby ponds, for firefighting.

6.EARTHQUAKE

Sustainable Practices

1. Avoid construction in high-risk areas, such as near fault lines or on unstable ground.
2. Organize awareness programs in local languages to educate villagers on earthquake preparedness and safety measures.

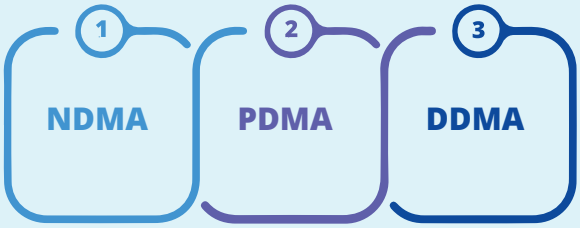
7. SMOG

Sustainable Practices

1. Encourage family members to avoid burning garbage, leaves, or fields, as it contributes to smog.
2. Trees help clean the air. Participate in tree-planting programs in your school or community.

PDMA 1129 Disaster Helpline

The National Disaster Management Authority (NDMA) governs disaster management across Pakistan. It oversees the Provincial Disaster Management Authority (PDMA), which provides emergency services through the **1129** helpline. At the district level, the District Disaster Management Authority (DDMA) operates early warning systems, ensures evacuations, provides essential services[13] .



1122 Emergency Helpline

In case of an emergency, especially during climate-induced disasters there are designated district authorities within reach through the **1122** helpline. These services are operational across all provinces.

1123 - Tele-Tabeeb

Tele-Tabeeb - **1123** is a telehealth initiative that is established by SIEHS. The helpline is open 24/7 and is operating nationwide to provide free medical consultation and mental health counselling virtually[14].

References

1. Author_Id, N. (2015). Global assessment report on disaster risk reduction 2015. Global Assessment Report on Disaster Risk Reduction. https://doi.org/10.18356/919076d9-en

2. Wang, J. (2016). Study on the context of school-based disaster management. International Journal of Disaster Risk Reduction, 19, 224–234. https://doi.org/10.1016/j.ijdrr.2016.08.005

3. Dawn. (2023, September 19). Deadly heatwave in Pakistan highlights dire climate challenges. Dawn. https://www.dawn.com/news/1853223

4. Sultana, F. (2013b). Gendering Climate Change: Geographical Insights. The Professional Geographer, 66(3), 372–381. https://doi.org/10.1080/00330124.2013.821730

5. Germanwatch e.V. (n.d.). Weather-related loss events in 2019 and 2000–2019. Retrieved from https://www.-germanwatch.org/en/19777

6. Macktoom, S., Anwar, N. H., & Cross, J. (2023). Hot climates in urban South Asia: Negotiating the right to and the politics of shade at the everyday scale in Karachi. Urban Studies, 00420980231195204. https://-doi.org/10.1177/00420980231195204

7. World Health Organization. (n.d.). Heatwaves and health: Guidance on warning-system development. Retrieved from https://www.who.int/publications/m/item/heat-waves-and-health--guidance-on-warning-system-development

8. Yale Program on Climate Change Communication. (2023, December 3). Heat wave risk perceptions. Retrieved from https://climatecommunication.yale.edu/about/projects/heat-wave-risk-perceptions/

9. Provincial Disaster Management Authority. (n.d.). Earthquake. PDMA Sindh. Retrieved from https://pdma.gos.pk/earthquake/

10. Akbar, M., Ullah, F., Ullah, M., et al. (2022). Development and application of models for landslide hazards in northern Pakistan. Sustainability, 14(24), 16663. https://doi.org/10.3390/su142416663

11. IQAir. (n.d.). Air quality in Pakistan. IQAir. Retrieved November 14, 2024, from https://www.iqair.com/pakistan

12. Xu, Z. (2023). Mixed reality drills of indoor earthquake safety considering seismic damage of nonstructural components. Scientific Reports, 13(1). https://doi.org/10.1038/s41598-023-43533-9

13. Pakistan Disaster Management Authority. (n.d.). Website title. Retrieved September 13, 2024, from https://pdma.gos.pk/ddma/

14. Sindh Integrated Emergency & Health Services. (2024). Tele Tabeeb. https://www.siehs.org/tele-tabeeb/

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