

CARE for South Asia

Climate Adaptation
and Resilience
for South Asia Project

Volume #6 | Jan - Jun 2023

**Interview with
Prof. Ilan Kelman,
Academic and
Author of 'Disaster
by Choice'**

**Re-evaluating
Coastal Risks:**
*A Discussion with
Climate Central CEO*

**Navigating Climate
Change in the
Maldives: Government
Insights**

**Gender Inclusion
and Technology in
Climate Resilience:**
Civil Society Perspective

The CARE for South Asia project is a partnership between ADPC, RIMES, and the World Bank to support informed decision-making for protecting development gains in South Asia

In This Issue

03 Lead Story

Relationship between Disasters and Climate Change

05 Perspective

Navigating Climate Change in the Maldives

07 Re-evaluating Coastal Risks: Land Elevation Data and Climate Change

09 Leaders

Gender Inclusion and Technology in Climate Resilience

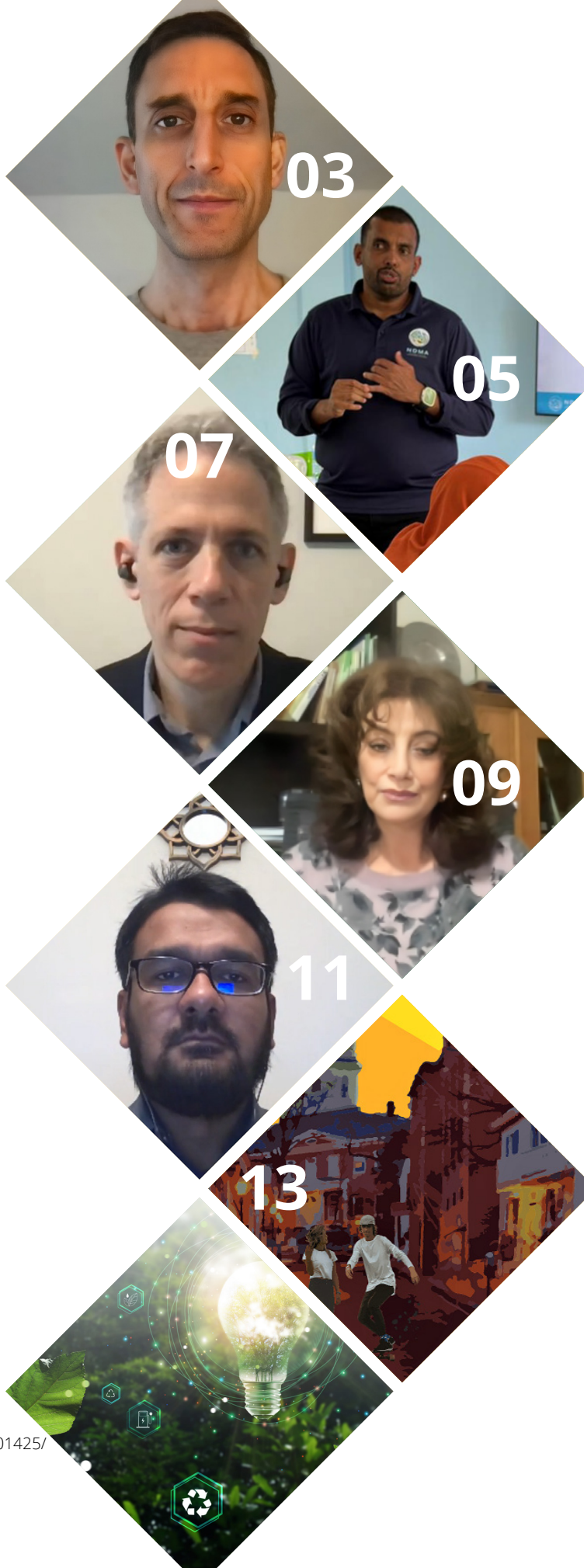
11 Preparing Transport Infrastructure for a Sustainable Future

13 Cli-Fi

Climate Fiction and Climate Realities

14 Breaking the Jargon

15 CARE for South Asia Project Updates





Professor Ilan Kelman

Lead Story

Relationship between Disasters and Climate Change

An Interview with Prof. Ilan Kelman

In your book, *Disaster by Choice*, you stated that 'disaster is a process manufactured by people and their choices.' Can you explain a little bit more about this statement?

A disaster isn't caused by the environment but results from societal decisions that allow the environment to cause harm to us.

Extreme events like earthquake and floods have caused significant damage. However, there are also certain events that did not lead to any disasters. This shows that the disaster is not simply a climatic event like – an earthquake, landslide, flood, or tsunami. A hazard becomes a disaster when people are affected. Why does that happen?

It can happen due to inequality and lack of opportunities and resources. While some have access to early warning information, enabling them to act accordingly during emergencies, others lack such access and face disproportionate impacts of disasters affecting lives and livelihoods.

Disasters can also cause damage to critical infrastructure. Building resilient structures will reduce damage to a great extent. "But who among us has the power to enforce building codes and plan regulations?"

We have to assess the building codes and their enforcement at the local and national level. Additionally, we must assess the governance mechanism to ensure that our buildings do not collapse during an earthquake or are not severely damaged due to cyclones or floods.

We need transformative choices and decisions.

If we want to reduce the number of people dying due to a cyclone or an earthquake, then we simply need to enforce the building codes. Also, there is a need to establish inclusive early-warning systems to ensure that all sections of society receive timely alerts.

At the same time, we also need inclusive mechanisms to combat socio-economic marginalization arising in the face of disasters. Additionally, through preparedness, their safety and well-being can be guaranteed.

Risk reduction is a choice made by the society!

The disaster is not what the environment is doing. Disasters are the societal decisions that make the environment cause harm to us.

You also said that ‘neither climate nor climate change, by definition, can be or can cause a disaster again.’ Could you explain that a little further?

Climate, by definition, is long-term weather patterns in a particular area, typically, for a period of 30 years. Although now the period is much shorter, i.e. 15 to 20 years.

But overall, the climate is average of the weather. Similarly, by definition, climate change is a change in the weather (logically speaking). But what it really says is that climate change, both natural and human-caused, is a change in the weather statistics.

“A disaster isn’t caused by the environment but result from societal decisions that allow the environment to cause harm to us.”

Weather is a natural phenomenon, and weather does not cause disasters. So, by definition, climate change does not cause disasters. There are exceptions, and nothing is straightforward.

The climatic anomalies like increasing heat and humidity levels are terrifying and have the potential to cause severe impacts.

This is human-caused climate change, and it is indisputable. We are causing changes to the weather statistics rapidly and substantively, leading to experiences of high heat and humidity not experienced before.

Adapting to these climatic changes on a daily basis is extremely challenging, particularly for those whose livelihoods depend on outdoor work for food.

For example, agricultural and construction workers toil regardless of the weather conditions. Similarly, in other industries like textiles, people work in situations where they do not have any cooling system. They can be mostly cramped in very hot buildings.

As I said, human-caused climate change is pushing us into extreme conditions that adversely affect health and livelihoods and lead to marginalization and increased inequality. Human activities can impact heat and humidity levels. Human beings can influence weather statistics that threaten lives and livelihoods.

This is just an eye-opener of the human-induced disasters that are currently happening and are causing high fatalities. Considering the impacts, disruptions, and problems awaiting humanity, it is alarming to state that climate change alone does not cause disasters.

It has been suggested that money and fiscal policies will actually change the way we look at climate change. But in essence, would US \$100 billion every year really tackle climate change?

Since 2009, many countries have been asking this question at climate change discussion forums and conferences, if it would be possible and appropriate for some countries to give US \$100 billion a year to other countries in order to tackle climate change.

But would it really have a significant impact, considering that between 2009 and 2022, governments subsidized fossil fuel companies directly at over US \$400 billion a year on average?

We need a roadmap to outline how governments can address climate change. Last but not least, we need to invest in helping people.

Mr. Ilan Kelman is a Professor of Disasters and Health at the Institute for Risk & Disaster Reduction at University College London (UCL) in the United Kingdom.

He is also the author of the book ‘Disaster by Choice: How Our Actions Turn Natural Hazards Into Catastrophes.’



Mr. Umar Fikry

Perspective

Navigating Climate Change in the Maldives

An Interview with Mr. Umar Fikry

What is the current climate risk profile of the Maldives?

The Maldives is one of the world's most vulnerable countries to climate change. It's a low-lying, flat island nation with around half a million population.

As a disaster management professional, I believe climate change is already here, and we need to act urgently.

Climate change is being felt through disasters. We know from statistics and incidents over the past five years that the intensity and severity of all hazards are increasing. Precipitation has become severe and is witnessed for a much shorter duration. Excessive

rainfall even for a short period exceeds the threshold of capacities of our small island state and island communities.

The frequency of flooding has increased and so has the damage. We also know that tidal activity has increased both on the shorelines and in the reefs. There is also increased coastal erosion in the islands.

Climate change is already here! For the Maldives, climate change and disaster events will bring existential challenges.



Repairs being made to rooftops damaged by heavy rainfall in the Maldives (Photo by NDMA Maldives)

How severe are the dangers, and is the Maldives population aware of the happenings around them?

The Intergovernmental Panel on Climate Change (IPCC) report's warning of 1.5°C. It gives the world a 15-year window to change its business-as-usual approach.

We know that once we cross 2°C of global warming, almost 80% of the world's coral reefs will disappear, and the Maldives islands are built on top of coral reef ecosystems.

Losing coral reefs would mean losing our population, culture, and the original language, which has sustained itself for over 2,000 years. Right now, the severity is increasing due to rainfall and tidal wave activities. Local fishermen incur more losses every year due to this.

“Climate change is already here! For the Maldives, climate change and disaster events will bring existential challenges.”



Mr. Fikry speaking at an Island Disaster Management Planning workshop in Dhiffushi, Maldives, as part of an ADPC's Strengthening Preparedness and Resilience Through Inclusive Community Governance in the Maldives (SPRING) project (Photo by NDMA Maldives).

We know that coastal households are damaged yearly during the rainfall season, and the aggregate impact of those damages over 10 years would be equal to a one-time big event such as a tsunami.

Is the government undertaking climate adaptation policies and proactive measures to enhance climate resilience?

The government is taking measures to reduce the impacts of climate change and disaster risks. Our five-year Strategic Action Plan covers climate and disaster risks across all cross-cutting areas.

The Maldives is also working towards the promise of leaving no one behind by building better transport networks, sewage systems, and sustainable wastewater management.

We are working with the local communities to build preparedness by ensuring every island has a disaster mitigation plan and that their capacities at the island level (in terms of trained people and equipment) are sufficient to mitigate and manage local-level disasters. We are trying to empower communities so they have the right people and the right tools at hand. Right now, we see island communities working on their own to revive ecosystems, mangroves, and beaches to address erosion.

Training and equipping people with knowledge and skills will make them more resilient and less dependent on national systems. If we have more resilient communities that are self-sufficient, then the most hazardous risks will be reduced. Also, a resilient community means more opportunities to focus on productive economic activities.

Mr. Umar Fikry serves as the Deputy Chief Executive at the National Disaster Management Authority (NDMA) in the Maldives.

Mr. Fikry spoke with ADPC at the Seventh session of the Global Platform (GP2022) in Bali, Indonesia. Watch his full interview on SAR-Climate [here](#).

Re-evaluating Coastal Risks: *Land Elevation Data and Climate Change*

A Discussion with Dr. Benjamin Strauss

The majority of the scientific community studying disasters and climate change seeks answers to questions like – how far and how quickly will the sea level rise during storms.

We have limited knowledge about the elevation of the vulnerable regions of the world.

Asia relies on satellite-based elevation data, and unfortunately, such data can potentially be inaccurate as compared to airborne-lidar data.

The image below shows airborne-lidar and satellite-based data for the same area, and as you can see, the former shows a much lesser threat.

When signals are emitted from the satellite to measure land elevation, by the time the beam transits into space and reaches the surface, it encounters obstacles such as rooftops and treetops.

The satellite signals typically cannot distinguish between a rooftop and a treetop. And forms the basis of all of the major global elevation datasets utilized by researchers today.

When rooftops and treetops blend in with ground elevation, it makes the land appear more elevated. This poses challenges while assessing flood risks and sea level rise impacts.

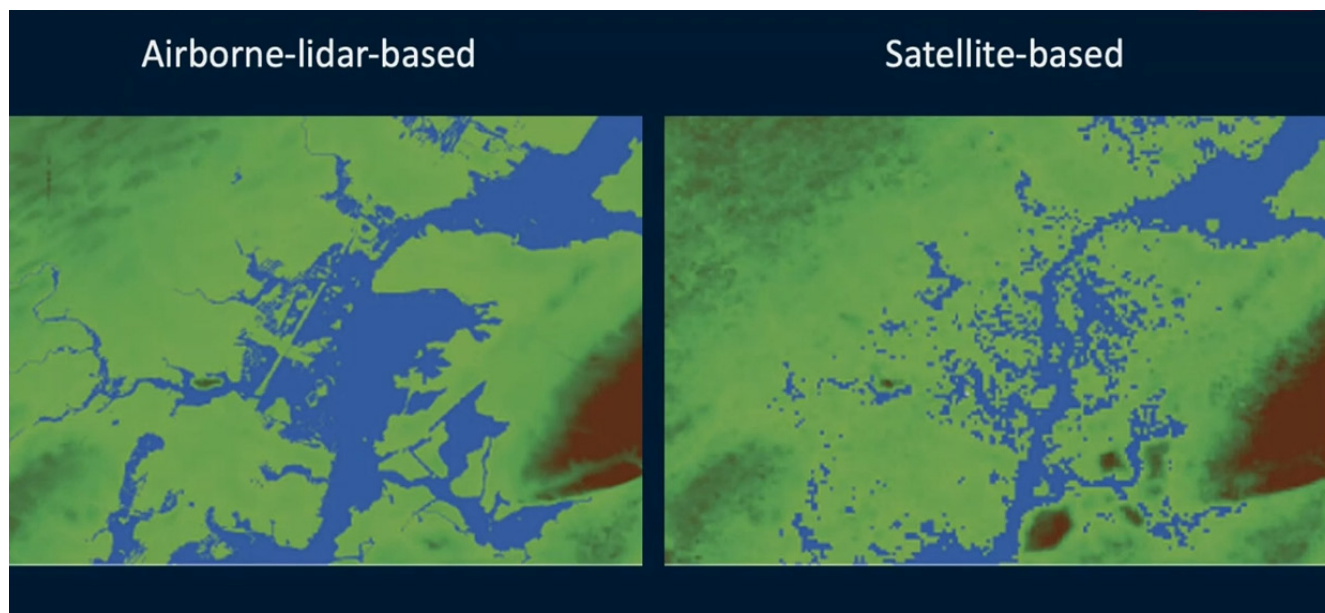
“We have limited knowledge about the elevation of the vulnerable regions of the world.”

However, a new dataset that a colleague and I developed uses machine learning to eliminate the interference of rooftops and treetops.

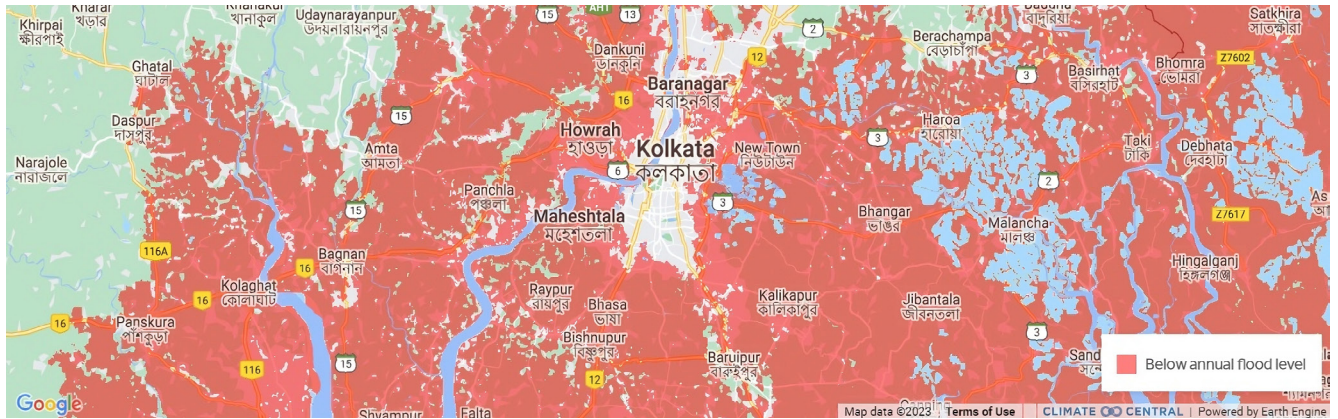
In September 2021, we also published the Coastal DEM v2.1, which is a high-accuracy and high-resolution global coastal elevation model.

The research community uses different datasets to assess the elevation of land; for example, the most popularly used dataset is MERIT. Other datasets used are SRTM, WdD3D30 developed by the Japanese government, TanDEM-X by the German Aerospace Agency, and NASADEM by NASA in the United States.

On average, all of these elevation datasets estimate the land to be one and a half meters higher than its



A comparison of airborne-lidar and satellite-based observations in the same area (Photo by Climate Central)



Land projected to be below annual flood level in Kolkata, India, by 2050 (Model by Climate Central)

actual height (or more). Consequently, our projections are incorrect, and that is concerning.

Kolkata in India, is under great threat of increased flooding due to the increase in extreme weather events. Let's look at the image above, the land is projected to be below the annual flood level by 2050.

Although the projections suggest future risks and is useful but it is not based on accurate information. There is a high likelihood of such datasets not considering the complexities of the densely populated urban downtowns of Kolkata.

There's also something very profound about sea level rise and climate change, i.e. ice takes time to melt.

Therefore, we have to understand the precise rate of sea level rise. Understanding the precise rate of sea level rise in the upcoming decades or century poses a significant challenge. However, we are confident in our projections and findings regarding the extent of ice melt and subsequent sea level rise based on the global warming scenario.

Despite the more than one degree Celsius of warming, the temperature has fortunately not yet reached the expected level. But the ice sheets continue to melt. It is anticipated that there will be approximately a two-meter rise in sea level from the carbon pollution already emitted into the atmosphere. This will cause a significantly greater increase in temperature, further causing sea level rise.



Dr. Benjamin Strauss

Dr. Benjamin Strauss is Chief Executive Officer and Chief Scientist at Climate Central based in New York, USA.

Gender Inclusion and Technology in Climate Resilience

A Discussion with Ms. Aisha Khan



How do women in Pakistan's mountain areas contribute to sustainable development?

The climate is changing, and we cannot allow the equity gap to increase. Therefore, we must hasten and accelerate our efforts to reduce this gap so that women's challenges are reduced, and their resilience is strengthened.

I work in mountain communities; therefore, I always talk about the role of women in the management of ecosystems or the relationship between women and nature in the mountain ecosystem.

In rural communities, people are faced with several challenges. For example, mountain women must travel long distances to collect water, gather firewood, water the fields, and harvest. They also play a critical role in managing and utilizing these resources.

However, they're not the managers of these resources, but they witness changes in temperature or precipitation patterns. The temperature and precipitation changes can cause a hydrological imbalance that directly impacts food security.

They also have a direct impact on a number of factors like health, agriculture and education, impacting women the most.

Hence, a host of other challenges are also faced due to the intricate relationship between humans and the environment. The overexploitation of the environment over a long period of time, is capable of impacting human lives.

I have been working in mountain communities for the last two decades, and my observation is that women understand these dynamics as nurturers and care providers. Perhaps it's part of their DNA to understand the value of conservation and the need to preserve and protect our ecosystem.

I also find that women are more receptive to learning. In addition, they understand the long-term benefits of climate adaptation, so I believe sustainability cannot be achieved without including women. Therefore, the sooner we empower rural women, the better equipped we will be to address climate change issues and adopt sustainable ways to interact with nature.

Pakistan is exploring new climate-smart investments in its Nationally Determined Contributions (NDCs). But how can such climate investments be gender-inclusive?

The first step towards inclusivity is improving gender equity. For instance, Pakistan has a Gender Action Plan, which makes a wide set of recommendations on plotting a gender-responsive strategy in the NDCs and meeting the emerging threats and challenges in climate mitigation and adaptation.

We have seen significant economic damage from the recent floods. The World Bank has estimated these losses at around US \$16 billion, and before that, Pakistan suffered losses at an annual rate of US \$3.8 billion for many decades.



Ms. Aisha Khan (center) participating in a Regional NDC Dialogue organized by ADPC in Bangkok, Thailand



Ms. Aisha Khan (right) interacting with youth in Gilgit-Baltistan, Pakistan (Photo by Stanford Law School)

Women will continue facing this challenge as the climate continues to change (leading to recurring disasters).

“The climate is changing, and we cannot allow the equity gap to increase.”

Economic losses will be huge, so it is important to include women in climate change decision-making to reduce economic losses.

What opportunities does technology provide for civil society organizations to empower women in the face of climate change?

Civil society organizations play a critical role as agents of change, and they have the potential to enhance their roles when it comes to innovation and technology.

For example, they can continue to create an enabling environment for women to contribute to environmental decisions. We live in the age of climate change, so we must keep up with this pace of change – we don’t have the luxury of time!

Therefore, technology can help civil societies bridge gaps through early warning, e-learning, agri-advisories, and telemedicine. All these things are technology-driven and can provide many opportunities for women to improve their coping capacities in times of disaster.

Across borders in South Asia, women can come together and share their experiences and best practices. They can learn from each other, and the opportunities are endless.

Aisha Khan is the Chief Executive of the Civil Society Coalition for Climate Change and CEO of the Mountain & Glacier Protection Organization in Pakistan.

She has over 20 years of work experience at the community and policy levels to strengthen climate action by supporting inclusive and participatory practices that promote social-ecological and democratic equity.



Watch the full panel discussion on SAR-Climate [here](#) to learn more about the different climate change-related challenges faced by women in the region.

Preparing Transport Infrastructure for a Sustainable Future

A Discussion with Dr. Muntasir Billah



A healthy transportation network is the lifeline of any country. Although global forums like the 27th Conference of the Parties (COP-27) had limited discussions on building resilient transport infrastructures, as compared to other priorities, extensive research is underway exploring new ways to prepare transport infrastructures to withstand the risks and impacts of climate change across the world.

My research, in particular, looks at the central theme of building innovative and resilient transportation infrastructure systems. I try to understand how cutting-edge technologies and advanced computational techniques can be used to support transport infrastructure and networks against various hazardous conditions like climate change.

My central question is to explore how we can prepare a resilient transport infrastructure for a sustainable future. A resilient transport network, in plain terms, is expected to give people the confidence to move in and out of areas without worrying about service disruptions from climate stressors and shocks.

First of all, transport infrastructure faces multiple threats like wear and tear, deterioration, and increased use due to increased utilization resulting from high population growth in developing countries.

Countries have identified and assessed the existing climate threats, and we have also devised resilient

designs and policies to maintain and sustain risk-free and resilient roads to prevent potential damage from climate risks. We need to come up with plans not only to develop new climate-resilient infrastructure but also to consider how existing infrastructures can adapt and what new mechanisms can be integrated to reduce potential risks. For example, bridges already consider climate change risks and their potential impacts on durability, but we also need to consider the ever-changing nature of climate risks.

The initiatives to build resilient infrastructure need to change – the results and findings we use today may not be relevant in the next 30 years! Bridges today are typically designed to have a service life of 80 to 100 years, so we need to keep developing and implementing new plans, designs, and policies that focus on developing resilient bridges to avoid failure. We also need to examine how current and traditional materials used in existing infrastructure have performed over the last decades.

Similarly, authorities should not overlook the fact that climate change impacts will be long-term and far more complex than what our transport infrastructures can endure. So now, not only do we need to update our design to become more resilient, but we also need to look into newer and advanced materials to build new infrastructures.

In the Asian context, populations are growing fast, and more people are living in vulnerable areas where climate change impacts are at an unprecedented rate. In South Asian countries like Bangladesh, India, and Pakistan, we have seen several climate-induced incidents that have washed away roads and bridges – cutting off access to vital food supplies and emergency facilities.



*An aerial view of Hatirjheel Lake Bridge in Dhaka, Bangladesh
(Photo by Salman Preeom on Unsplash)*



A flooded road on the Sylhet-Sunamgunj highway near Sylhet, Bangladesh (Photo by Anish Joshi/ADPC)

To improve the climate change resilience of transportation infrastructure in South Asia, all stakeholders and partners need to work together to identify the specific and significant threats that can jeopardize development gains.

This process should be inclusive and needs broader consultation to create a sense of shared ownership and joint vision – both from the transport user perspective and the infrastructure development perspective – to build resilience.

“We need to come up with plans not only to develop new climate- resilient infrastructure but also to consider how existing infrastructures can adapt.”

I know there have been a lot of efforts put in by South Asian agencies in the region so far to develop climate resilience, but more needs to be done because the effects of climate change will increase.

If we don't take sufficient action in the next few years, it may result in significant economic impacts and continue to influence the quality of life of many people. Interruptions in local transport can severely impact regional transportation systems and ultimately disrupt the overall road network. Access to services will be challenging.

The roadmap to ensure a resilient transportation system is complex due to the dynamic nature of the risks. A resilient transportation system should consider the adoption of new design guidelines, research, development, planning, and implementation based on the changing climatic scenario.

Dr. Muntasir Billah, P.Eng., M. ASCE, is an Assistant Professor in the Department of Civil Engineering at the University of Calgary, Canada.

Climate Fiction and Climate Realities

Climate Fiction, popularly abbreviated as 'Cli-fi', is a great source of learning about climate change and its potential impacts on humanity

Books:



***The Big Melt*
by Ned Tillman (2018)**

Kottie Christie-Blick, a Climate Change Education Consultant from the USA, outlines the following in her review of the book. "The main characters show us how life is rapidly changing as their town reaches a climate tipping point and begins experiencing prolonged excessive heat – melting streets, drying up sources of water, dying plants, and hurricane-force winds.

The main characters come to understand that even if they can't fix all the problems; they can at least make a difference in people's lives and that moving forward with purpose is empowering".

The Big Melt challenges us all to confront what is rapidly becoming the greatest threat of the 21st century – the climate crisis.



***Thank You, Earth*
by April Pulley Sayre (2018)**

Told through simple photography and a limited number of words, Sayre writes an ode to earth – to the big and the small, the good and the bad, the animals and colors that constantly amaze us.

Sayre also writes an important note at the end that it isn't enough to just say thank you, we need to show our appreciation by doing something to help care for and preserve our earth. She gives many examples of how people with a variety of strengths can use those skills to make a difference.

Winner of the Green Prize for Sustainable Literature and a Green Earth Book Award Long List title.

Movies:



***Wall-E (2008) directed
by Andrew Stanton***

Set on a desolate earth abandoned by humanity due to environmental ruin. Wall-E the robot is programed to clean the planet. The film warns about environmental threats, population increase, consumerism, and the consequences of neglecting our planet.

Wall-E is a song from a dying planet, a dystopian science-fiction romance.



***Ice Age: The Meltdown*
(2006) directed
by Carlos Saldanha**

The movie is set in a rapidly warming world and reminds us of the environmental impacts of climate change. The adventures of Manny the Mammoth, Sid the Sloth, and Diego the saber-toothed tiger are fun-filled as they navigate through melting ice, rising sea levels, and other environmental challenges.

The movie encourages us to think about the conservation of the planet and address issues of climate change.

Breaking the Jargon

By Dr. Niladri Gupta, Senior Water Resources Management Specialist, ADPC

Coastal Zone:

A coastal zone is land area within 10 kilometers of the coastline.

(Source: [Please find here](#))

Integrated Coastal Zone Management (ICZM):

An integrated approach for sustainably managing coastal areas, considering all coastal habitats and uses.

(Source: [Please find here](#))

Coastal Erosion:

Coastal erosion is the process by which local sea level rise, strong wave action, and coastal flooding wear down or carry away rocks, soils, and/or sands along the coast.

(Source: [Please find here](#))

Sea Level Rise:

Increase in the height of the sea with respect to a specific point on land. Eustatic sea level rise is an increase in global average sea level brought about by an increase in the volume of the ocean as a result of the melting of land-based glaciers and ice sheets. Steric sea level rise is an increase in the height of the sea induced by changes in water density as a result of the heating of the ocean.

(Source: [Please find here](#) and [here](#))

Coastal Regulation Zone:

The Coastal Regulation Zones (CRZ) are the areas that potentially impact the natural, financial, and social ecosystem of a country's coastline. Rules under CRZ are generally designed to strike a balance between urban development, native lifestyle and environment. Any development under these CRZs requires adherence to the rules by the regulation.

(Source: Ministry of Environment, Forest and Climate Change, Govt. of India).

Atoll:

When an island completely subsides beneath the water leaving a ring of growing coral with an open lagoon in its center, it is called an atoll. E.g. Sri Lanka is an island while Maldives is an atoll.

(Source: [Please find here](#))

Coral Bleaching:

Coral bleaching occurs when seawater is too warm, resulting in the expulsion of the algae (zooxanthellae) living in the coral's tissues causing the coral to turn completely white. Rise in sea temperature due to climate change is resulting in coral bleaching across the oceans. Bleaching is predicted to occur three times a decade on the Great Barrier Reef, if warming is kept to 1.5°C.

(Source: [Please find here](#))

Ocean and Climate Interaction:

The ocean influences weather and climate by storing solar radiation, distributing heat and moisture around the globe, and driving weather systems. Ocean currents act much like a conveyor belt, transporting warm water and precipitation from the equator toward the poles and cold water from the poles back to the tropics. Thus, ocean currents regulate global climate, helping to counteract the uneven distribution of solar radiation reaching Earth's surface. Without currents in the ocean, regional temperatures would be more extreme — super hot at the equator and frigid toward the poles — and much less of Earth's land would be habitable.

(Source: [Please find here](#))

Blue Economy:

World Bank defines blue economy as the sustainable use of ocean resources to benefit economies, livelihoods and ocean ecosystem health.

(Source: [Please find here](#))

CARE for South Asia Project Updates



The Agricultural Sector's assessments of current policies and frameworks cover climate-smart and economically competitive agricultural systems in Bangladesh, Nepal, and Pakistan.

These assessments include studies like Policy Practices for Gender-Inclusive Climate Resilient Agriculture in Pakistan, Climate-Smart Green Action Plan for Punjab in Pakistan, Policy Review support on Climate-Smart Livestock Sector in Bangladesh, guidelines on the application of CSA technologies and agroclimatic zoning in Bangladesh. Such studies ensure an understanding of climate impacts to strengthen the implementation of resilient agricultural methods to enhance food security.

Field visits were conducted to collect knowledge and information on best practices along with spatial data of physiographic zones of Sindh in Pakistan. The agricultural sector also organized capacity development initiatives to strengthen the capacities of government officials through training on EIA CDM in Pakistan.

Such studies, field visits, and training in the agricultural sector provide an in-depth understanding of the observed risks and raise the most critical issues of climate adaptative agricultural solutions.



The Water Sector conducted assessment studies on the gaps and needs of the water resources policies in Nepal, Pakistan, and Bangladesh. In Pakistan, two Technical Working Groups (TWG) were constituted, one for Groundwater Information Systems and one for best practices on climate-adaptive water resource management to provide recommendations on the pathways of climate-resilient integrated water resources management solutions.

Extensive fieldwork on Drought Risk Management, at both national and local levels, was conducted to gain perspectives through FGDs with farmers and CBOs.

The fieldwork conducted on Karez systems and check dams on the sites in Balochistan revealed the potential climate risks and challenges of the water resources. Such studies, field visits and trainings enabled government stakeholders to strengthen climate-adaptive water resource management across the most vulnerable regions of South Asia.



PPF Sector conducted studies like climate indicators and screening tools for integration into PC-1 proforma which provides concrete steps for mainstreaming climate change into project design stages (PC-1) by developing climate indicators and project screening tools. These studies foster the development of climate resilience to increase adaptive capacity and economic inclusion.

The PPF sector also organized trainings to improve the implementation of adaptation actions through local-level climate investments and policies.

These studies and capacity development initiatives address the most pressing issues of climate change and provide mechanisms to improve the implementation of adaptation actions and promote inclusive and resilient development.



The Transport Sector conducted studies like the Gap Assessment in Bangladesh in 2021, Road Design Standards of LGED, CNA and module development for HVRCA1, review of existing national guidelines, international best practices of local road infrastructure, review of existing national guidelines, SoPs and international best practices of Climate-Related Hazard-Risk Assessment of Road Transport Infrastructure in Nepal. A comprehensive assessment of landslide susceptibility was conducted in Bagmati and Madhesh Provinces, Nepal. Utilizing Unmanned Aerial Systems (UAS) and geological studies, four specific roadside landslide sites were analyzed. These studies provide crucial climate actions to enable a resilient transport system contributing to sustainable development.

Two specialized trainings on the UAS Survey and the Analysis and Utilization of UAS-Generated Data and Geotechnical Surveys were conducted as a part of HVRCA in Nepal in January and February.

The field studies included innovative methods like observation through drone surveys and geotechnical assessments. These studies revealed the most pressing issues faced in developing resilient road infrastructure.

The Climate Adaptation and Resilience (CARE) for South Asia project brings together data, tools, guidelines, and capacity to mainstream climate adaptive measures in the agriculture, water resources management, transport, and finance & planning sectors. It contributes to an enabling environment for climate resilience policies and investments in climate-sensitive sectors in South Asia, initially focusing on interventions in Bangladesh, Nepal and Pakistan.

Implemented By



Supported By



Asian Disaster Preparedness Center

SM Tower, 24th Floor 979/66-70 Pahonyothin Road
Phayathai, Bangkok 10400 Thailand

Tel: +66 2 298 0681-92

Fax: +66 2 298 0012

E-mail: adpc@adpc.net

www.adpc.net

**Regional Integrated Multi-Hazard
Early Warning System (RIMES)**

2nd Fl. Outreach Bldg., AIT Campus, P.O. Box 4
Klong Luang, Pathumthani 12120, Thailand

Tel: +662 516 5900 to 01

Fax: +662 516 5902

E-mail: rimes@rimes.int

www.rimes.int