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Resilience 101

Introduction to Resilience Thinking

Project 101137814



Avoid distractions



Be comfortable



Use the chat for questions or raise your hand if you want to speak

Who's in the room?

Name – Location – Job/expertise - One word that describes your mood today

Example: *"Sophie – The Netherlands – Climate expert at CAS - Excited!"*

Please answer in the chat

Who are we?

Tinka



Sophie



Fitse



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What are we going to do today?

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Agenda

- Welcome
- SAFE4ALL Learning Program Introduction
- Understand the Key Principles of Resilience
- Explore Examples of Resilient Solutions
- Explore Tools for Resilience Building
- Closing

Today's learning goal

Be able to explain the basic principles of resilience



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Learning Program

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9 SAFE4ALL tools and services

16 SAFE4ALL expert partners

SAFE4ALL LEARNING MODULES



1. Onboarding training modules (2025)
2. Needs-Based Training (2026 and 2027)

RESILIENT CITIES NETWORK

Climate Adaptation Services

ONBOARDING
LEARNING PROGRAM
2025 SCHEDULE

Session #	Session Name	Session Type	Date	Purpose
1	The Fundamentals of Climate Change - History and Science	Online	April, 2025	Building foundational understanding on climate
2	The Fundamentals of Resilience	Online	May, 2025	Building foundational understanding on resilience
3	Understanding Climate Risk and its impacts across systems	Online	June, 2025	Building foundational understanding on climate risks
4	Fundamentals of Climate Services	Online	July, 2025	Building foundational understanding on climate tools
5	Stakeholder engagement: communicating information and climate risk	Online	September, 2025	Communicating climate risk to a broad range of stakeholders
6	Introduction to Climate Stories	Online	October, 2025	Communicating climate risk to a broad range of stakeholders
7	Building buy-in and gaining political commitment for action	Online	November, 2025	Communicating climate impacts and inspiring action

Monthly sessions until November!

Session recordings will be hosted on the climate atlases

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Receive news and updates about SAFE4ALL Africa

https://mailchi.mp/c8b95dfbd95c/safe4all-africa

The Resilient Cities Network is the world's leading urban resilience network. We are made up of **practitioners.** We bring together global knowledge, practice, partnerships and funding to empower our cities.

Our mission is to reduce the vulnerability and improve the well-being of over 220 million urban dwellers around the world.

Content for this training daws upon the over 10 years of experience of R-Cities and its network cities



101 Cities

47 Countries

6 Continents

21 Languages

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How is our world changing?

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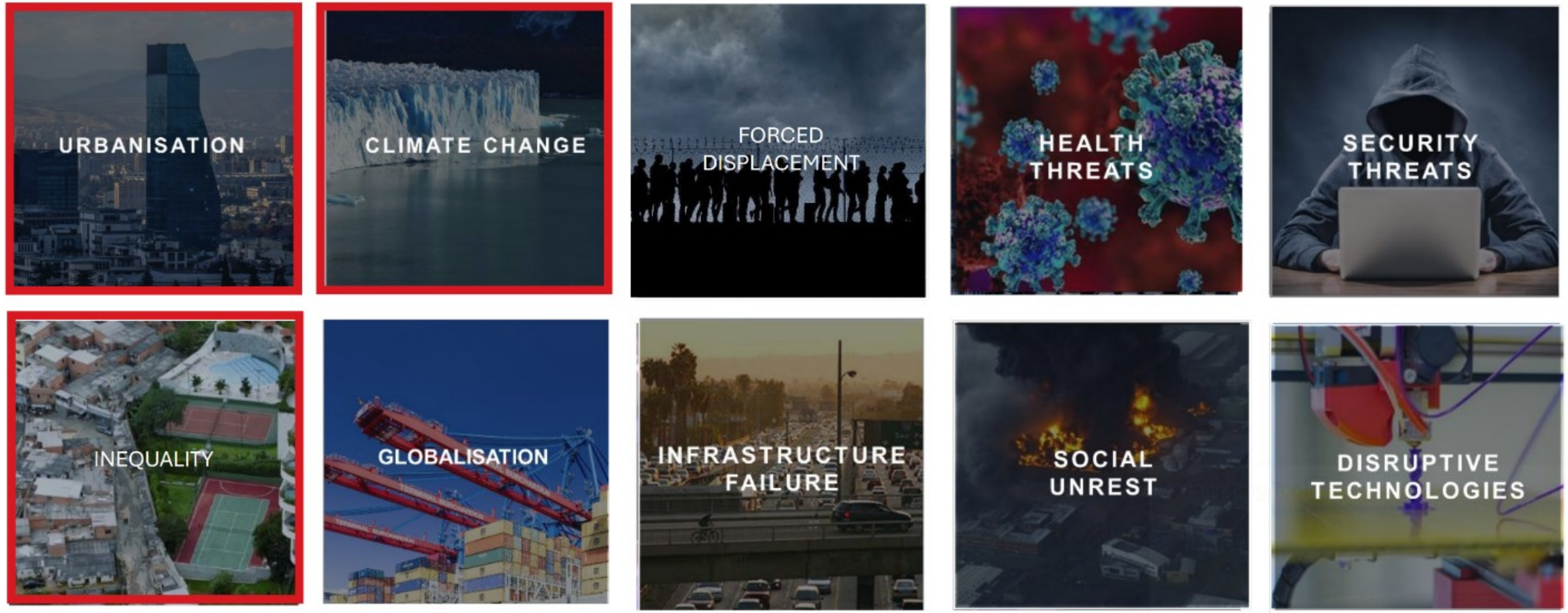
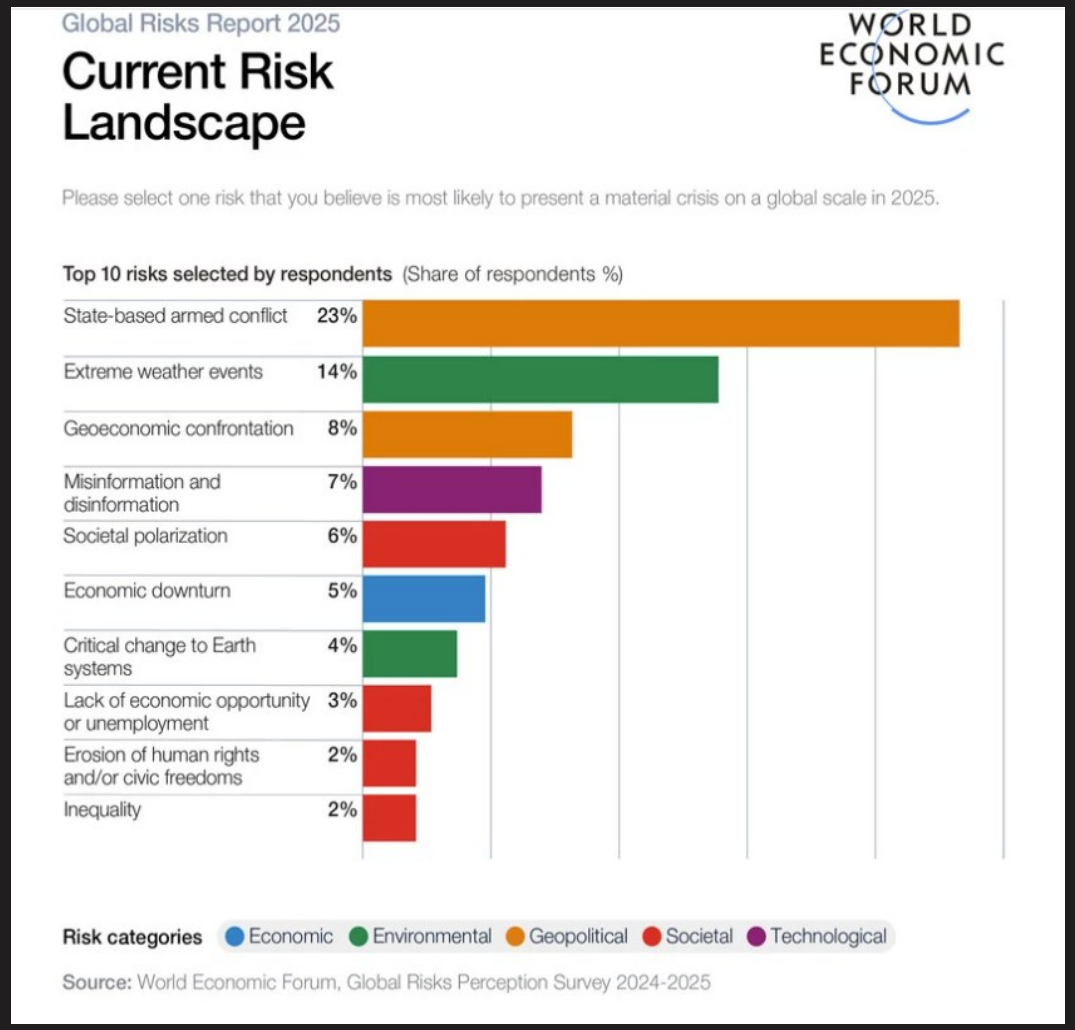
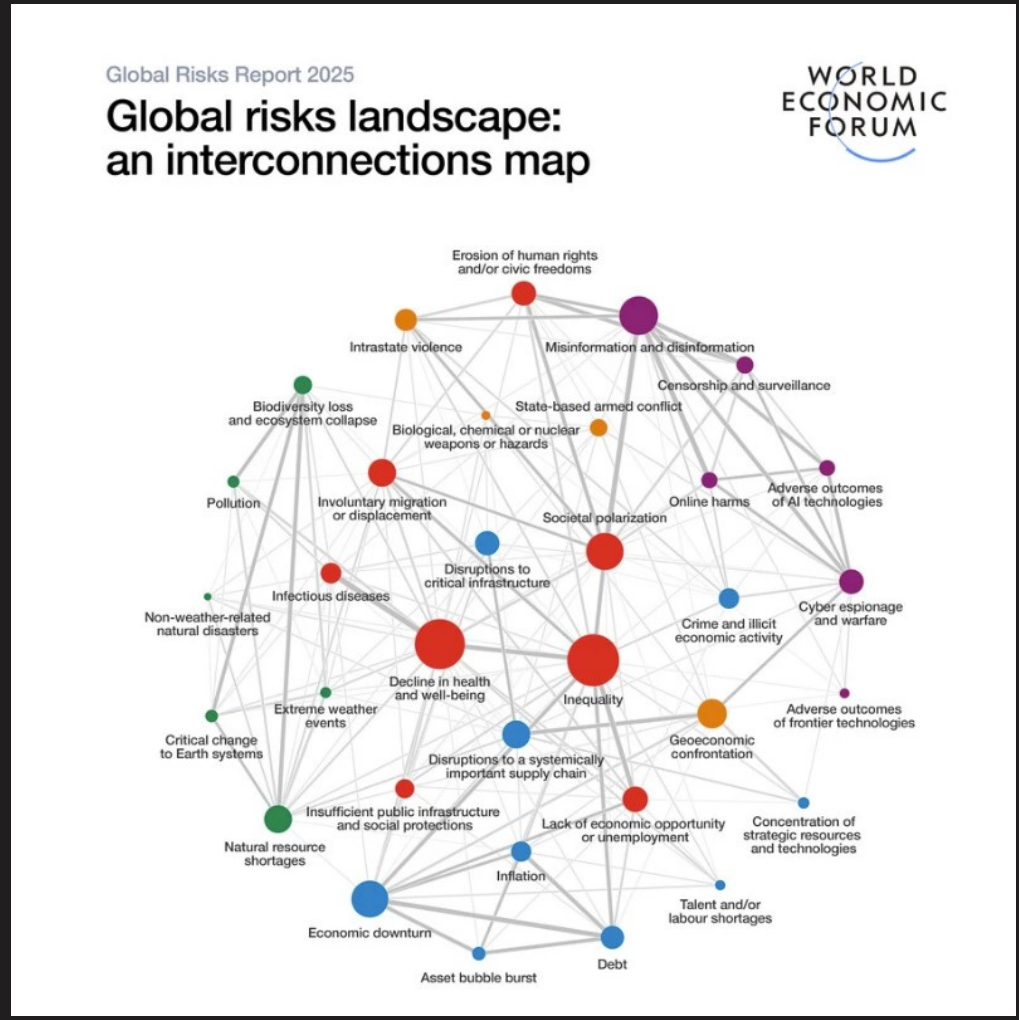
Our World is changing fast!



We are simultaneously facing inter-related and compounding risks



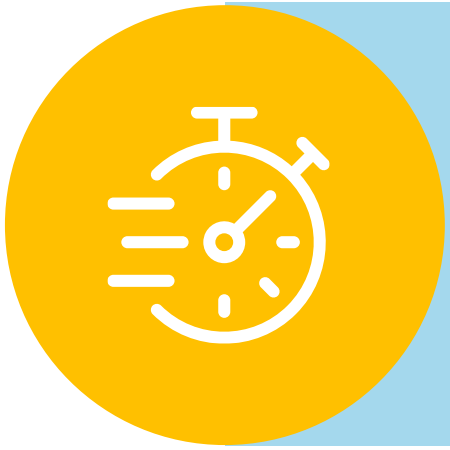


What are we dealing with?



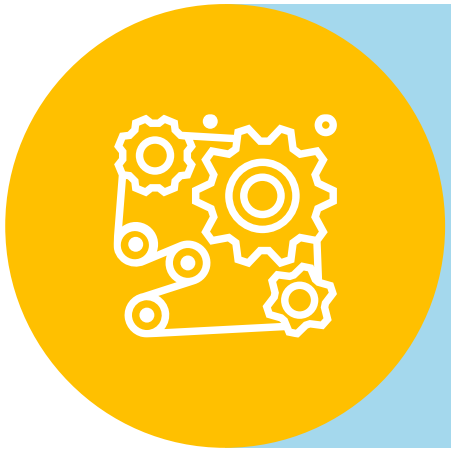
1. Polycrisis

Reality: we simultaneously face multiple interconnected crises and transformative transitions.



2. Speed

Fact: Global policies, infrastructure and planning, are not keeping pace with these new realities.



3. Capacity

Fact: Most of the world lacks the necessary capacities and tools to meet the needs of our rapidly evolving and interconnected world.



4. Silos

Fact: We are often dealing with challenges in isolation, even if others are tackling the same or similar challenges.

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How do we build our resilience to these changes?

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Have you ever used the term **Resilience** before?

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What does **Resilience** mean to you?

WRITE BRIEF ANSWER IN CHAT OR ANSWER BY RASING HANDS

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Holistic Resilience

The capacity of individuals, communities, institutions, businesses, and systems **to survive, adapt, and thrive** no matter what kinds of chronic stresses and acute shocks they experience.

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Holistic Resilience

To prosper, grow, or achieve success

To endure or continue functioning

The capacity of individuals, communities, institutions, businesses, and systems **to survive, adapt, and thrive** no matter what kinds of chronic stresses and acute shocks they experience.

To modify or adjust behavior, processes, or systems

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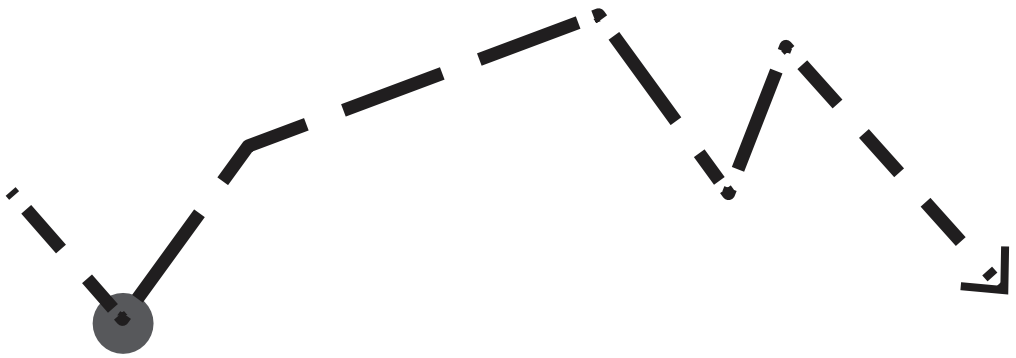
What is Resilience?

Resilience is the capacity of a system to maintain or recover functionality in the event of disruption, retaining its basic function and structure

To understand the concept of Resilience we draw from several disciplines including:

- **Ecology**
- **Structural Engineering**
- **Psychology**
- **Socio-Ecology**



Shocks and stresses can bring opportunities for cities to **evolve**, and in some circumstances, transform.

We strive to have disruptions and downturns that lead to "bouncing forward"
and "become stronger."



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Questions



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What are Shocks and Stresses?

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Holistic Resilience

The capacity of individuals, communities, institutions, businesses, and systems **to** survive, adapt, and thrive no matter what kinds of **chronic stresses** and **acute shocks** they experience.

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RESILIENT CITIES NETWORK

acute SHOCK

An **unexpected and sudden natural or human-made disruption** threatening major loss of life, damage to assets and the ability to function and meet basic needs, particularly for poor or vulnerable populations

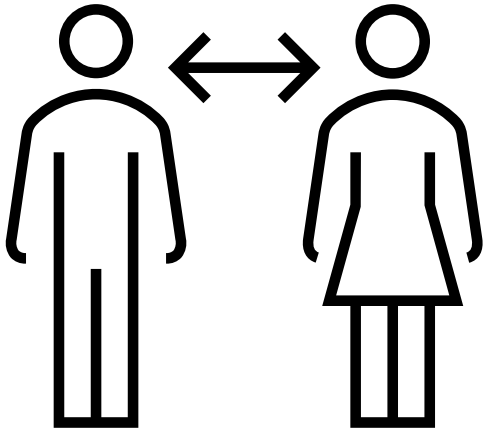




chronic STRESS

An **ongoing or cyclical natural or human-made challenge** that renders a system less able to function and provide basic services, particularly for poor or vulnerable populations

Let's think about the human body



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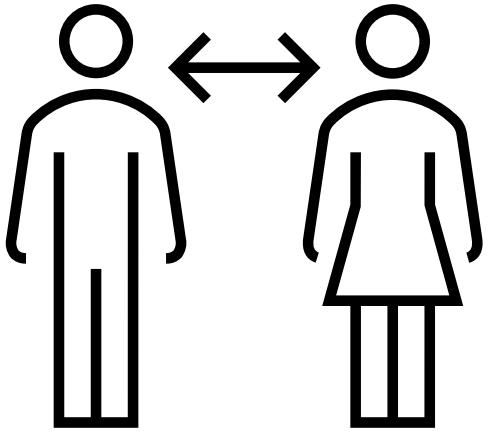
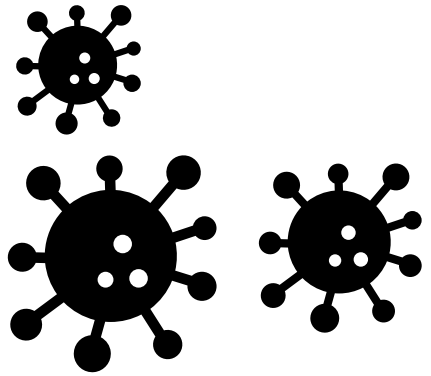
Stress – Malnutrition

- You are not getting enough nutrients
- You are losing weight
- You are weaker overtime
- Your growth may become stunted







- You body is being attacked
- You are in sudden pain
- You are incapable of doing things

Shock – Covid-19

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Stress – Malnutrition

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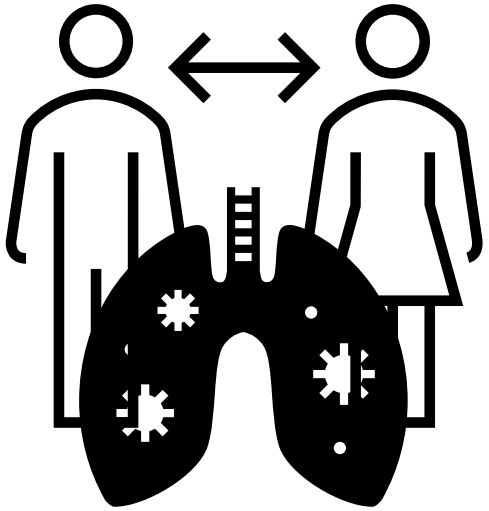
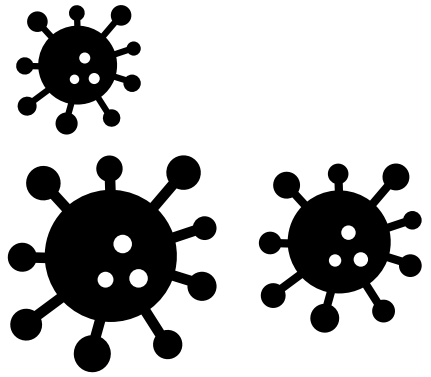
What happens if a malnourished person catches Covid-19?





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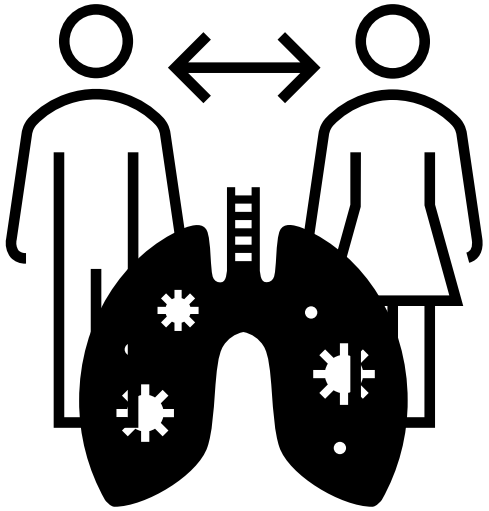
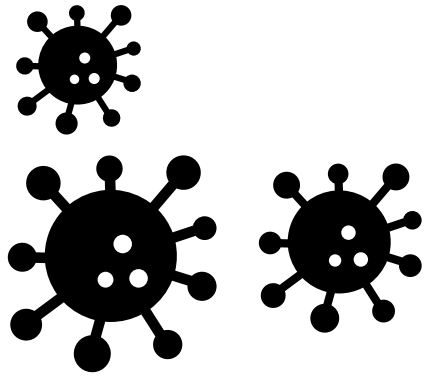
This shock and stress may lead to full system collapse





- You body is being attacked
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Shock – Covid-19

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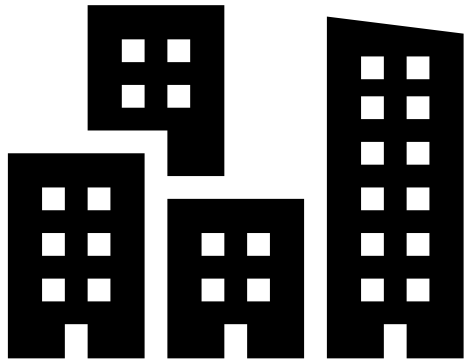
What happens if a region, city, town or neighbourhood with chronic stresses experiences a sudden shock?

Stresses

climate change, water scarcity, poverty and inequality, traffic congestion, unemployment and underemployment, food insecurity, crime and violence



earthquakes, floods, hurricanes, fire outbreaks, social unrest, terrorist attacks, power outage, pandemics, chemical spills , extreme heat

Shocks

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Cascading crises of Flooding in Nairobi

Flood events in Nairobi, Kenya have had more catastrophic impacts because of existing stresses including:

- **El Niño Effect**: Unusually intense rains overwhelmed the city's capacity.
- **Rapid Urbanization**: Population surged from 100,000 to 4.5 million; infrastructure didn't keep up.
- **Poor Drainage Planning**: Inadequate systems, blocked drains, and open sewers worsened flooding.
- **Vulnerable Settlements**: Informal neighborhoods built on floodplains, with no proper sewage or drainage were more exposed
- **Concrete Overload:** Urban sprawl reduced absorbent green spaces—water has nowhere to go



Kenya: Floods cause widespread devastation in Nairobi

24 April 2024

Share Save

George Wright
BBC News

The UN says more than 40,000 have been forced from their homes

Roads have turned into rivers in the Kenyan capital Nairobi, as a top official said flooding had "escalated to extreme levels".

Heavy rain has pounded Kenya in recent days, causing widespread devastation

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Cascading crises of Flooding in Nairobi

The existing stresses made the impacts of the floods that much worse

- **Displacement:** Over 40,000 residents displaced due to extensive flooding.
- **Road inaccessability:** Overflowing rivers and blocked drains transformed roads into waterways**.**
- **Increasing inequities:** areas like Mathare and Mukuru, built on floodplains, experienced severe damage.
- **Loss of life and Emergencies:** At least 32 fatalities reported; residents stranded on rooftops requiring evacuation

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Intersection of Shocks and Stresses

In an ideal world we would face one stress or shock at a time, respond and recover from it before the next crisis. **This is not the reality we face. We face overlapping crises causing a polycrises.**

By focusing on resilience, we are better equipped to handle the complexities of these overlapping crises.

When we analyze the interconnection between shocks and stresses, it helps us see and understand the gaps or flaws in our systems.

This requires a multi-dimensional approach to resilience, **integrating urban planning, infrastructure resilience, environmental sustainability, and global cooperation**.



Climate Change



Rapid Urbanization



Globalization



Inequity

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What is a **shock** you have recently experienced in your community?

WRITE IN CHAT OR ANSWER BY RASING HANDS

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What **stress** made your experience of a shock worse?

WRITE IN CHAT OR ANSWER BY RASING HANDS

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Questions



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How do we think about Resilience Holistically?

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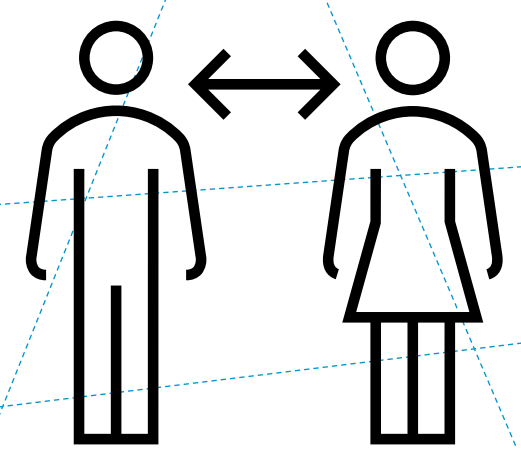
Resilience is underpinned by Systems Thinking



Systems thinking is a way of looking at the big picture. Instead of focusing on just one piece of a problem, you try to understand how all the parts work together.

Systems thinking = seeing how body systems work together

Interconnectivity = how a change in one system impacts other

The same applies to our communities, cities, regions and our world

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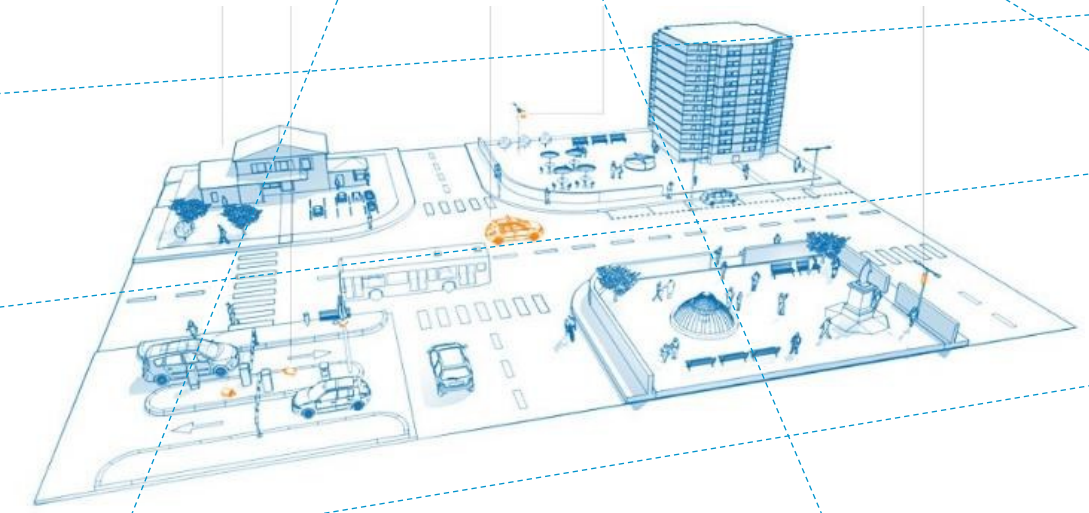
Resilience is underpinned by Systems Thinking



We rely on a complex web of systems to perform essential functions including **institutions, infrastructure and information systems.** These systems include things like:

- **Physical assets**: Buildings, roads, and parks, water mains, electricity grids, businesses, health care centers etc
- **Process based assets**: laws, community cooperation, standards, information sharing systems

The more robust each individual system is to shocks and stresses, the stronger the we are overall

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What **system** do you think is most critical to invest in when building resilience and addressing shocks and stresses?

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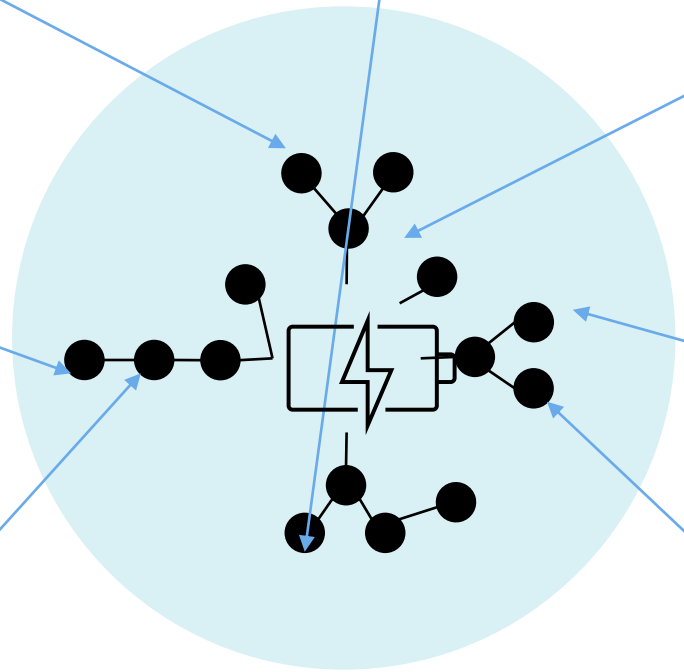
Economy: Power cuts impact business activities and industry, **reducing competitiveness, slowing down economy** development and job reducing job creation potential

Transport: The energy system powers **railway systems and EVs**, and disruptions in it can halt mobility; **Traffic lights** depend on electricity and energy disruptions may lead to traffic accidents

Waste: Waste-to-energy systems can help lessen the burden on current waste management and disposal options while supporting and improve the capacity to **generate alternative** energy resources



Food: Cold-chain storage and refrigeration are vulnerable to power outages, which could lead to problems with food quality, and disease outbreak

Water and Sanitation: Electricity is used to run pumps that treat and distribute water. Power failures leads to treatment plants being shut down or infrastructure being damaged, resulting in **sewage leaks, water cuts or water-quality problems**

Safety and security: Lack of public lighting due to power outages increases residents' vulnerability to **burglary and armed robberies**

Health : Energy disruptions lead to **lack of capacity to provide healthcare** and wastage/contamination of medicines and vaccines

Let's look at the Energy System

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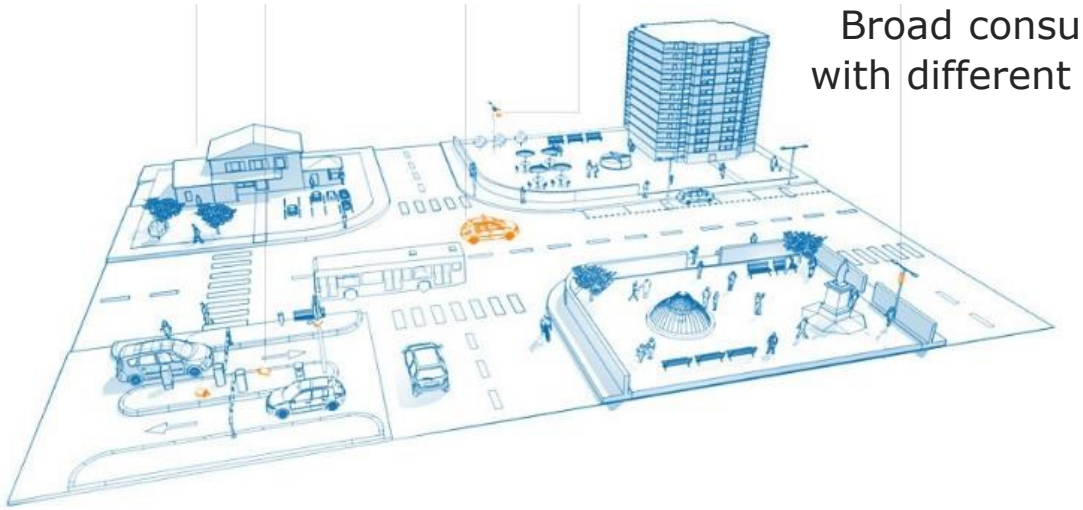
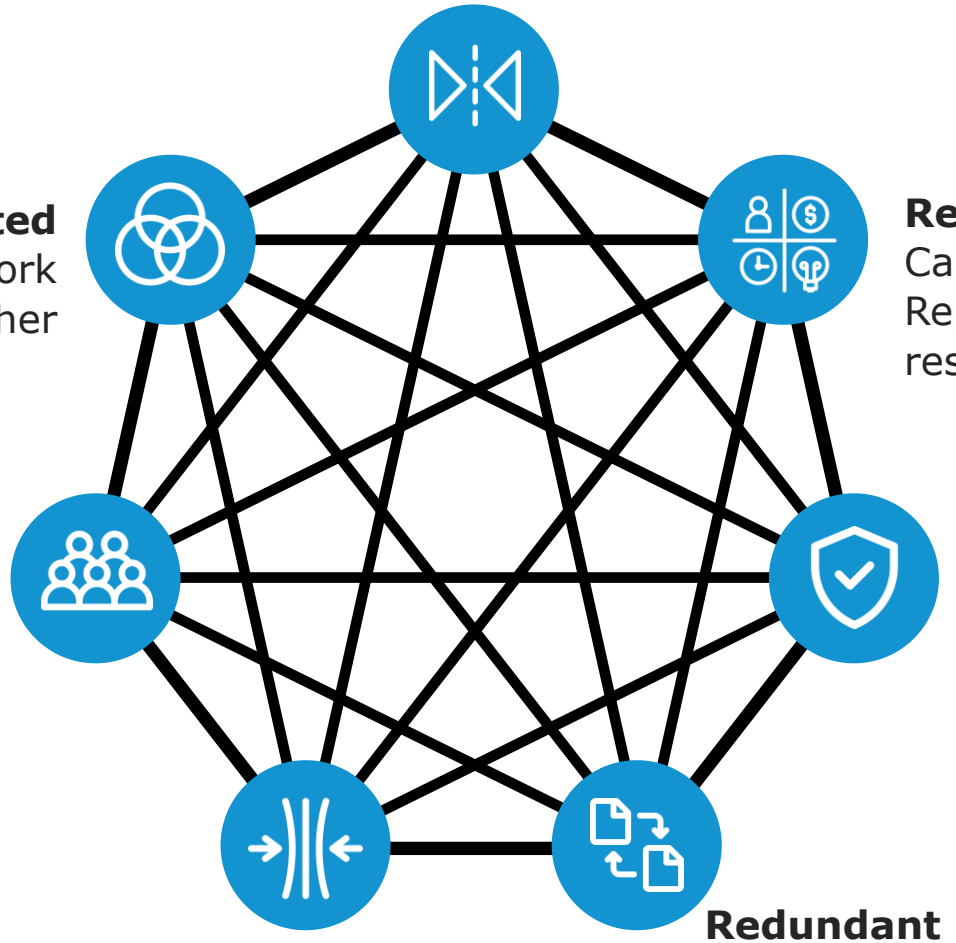
What are the qualities of a Resilient System?

Resilience thinking works to enhance, preserve or build these qualities into numerous complex systems that make up our environment.

Identifying them into **programs and projects** is important for all decision-makers, both inside and outside of government.





Reflective
Able to learn

Integrated
Systems work together

Resourceful
Can easily Repurpose resources

Inclusive
Broad consultation with different actors

Robust
Well conceived, constructed and managed

Flexible
Has alternative strategies

Redundant
Has backup capacity

What are the qualities of a Resilient System?

Reflective	Resourceful	Robust	Redundant	Flexible	Inclusive	Integrated
Ability to learn	…and act	…conceiving systems & assets that can withstand shocks and stresses, while using alternative strategies to facilitate rapid recovery…			… planned to take account of needs and promote coordinated actions.	

Source- Jo de Silva, Arup

Which **quality of a resilient system** resonates most with you?

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Questions



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What does a resilience solution look like?

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Resilience is ...

Understanding shocks & stresses

Have strategies that understand potential challenges, how they interact with one other, how they can **be addressed in a manner that improves our systems**

- **Stay informed:** Create mechanisms to collect reliable information and stay informed
- **Recognize the interconnectivities of challenges**: Understand how different issues interact with one another
- **Leverage shocks and stresses:** Use understanding to design better systems

Resilience is ...

Considering the interconnectivity of all systems

Understand and solving complex problems by looking at the **whole picture rather than just its individual parts**, emphasizing the relationships, patterns, and dynamics

- **Be cognizant of systemic interdependencies:** understand the impacts of shocks, stresses and successes in each system
- **Ensure cross-sectorial collaboration**: Integrate planning processes to maximize impact
- **Maximize adaptability and learning:** share knowledge, resources and innovation to improve interventions

Resilience is ...

Planning for Co-benefits / Multipliers

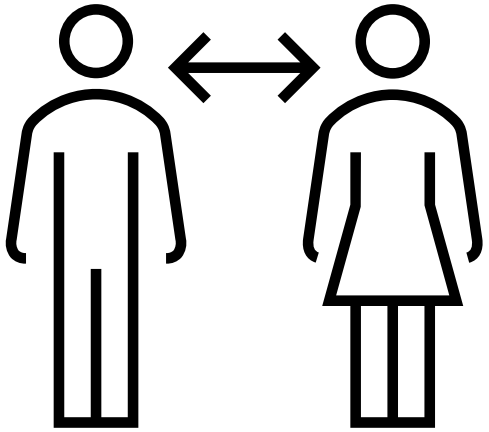
Have strategies that **not only solve one key challenge but also generate additional positive impacts** in other areas

- **Address Multiple Needs:** Address the core challenge while providing additional benefits.
- **Ensure Holistic Thinking**: Solutions that connect water, energy, food, health, and social systems.
- **Engage with different stakeholders**: Ensure multiple perspectives are added into planning
- **Maximize Efficiency & Sustainability:** Maximizing positive impacts with fewer resources.

Exercise as a solution with multipliers that generate co-benefits

Stresses

- Weak raspatory and circulatory systems
- Mental health issues
- Poor digestion
- Weakening bones and muscles overtime
- Unregulated sleep schedule



Shocks

- Disease outbreaks
- Health emergencies

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Resilience solutions in the real world

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Wetland protection for flood protection & recreation in Kigali

Kigali's Nyandungu Wetland Eco-Park is a rehabilitated wetland aimed at restoring biodiversity, mitigating flooding and enhancing community wellbeing

This restoration effort is being scaled to 5 other wetlands in the city – reviving the city's wetlands (20% of which are degraded)

Stresses

- Environmental pollution
- Biodiversity loss
- Lack of green spaces

Shocks

- Flooding

Multipliers

-Job creation
-Education on green biodiversity, climate change and ecosystems
-Tourism and Recreation
- Effective wastewater treatment

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Empowering children and mothers in Addis Ababa

Addis Ababa's Early Childhood Development Program is tackling the creation of a liveable city for children by strengthening the economic opportunities of their mothers by providing them with effective entrepreneurship training and seed capital for business development

The program works with both refugees and host communities

Stresses

-Lack of access to effective education
-Food insecurity
-Homelessness
-Unemployment

Shocks

- Economic hardship

Multipliers

- Building social cohesion between host communities and refugees/IDPS
- Gender equity

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Transforming schoolyards for climate action in Quezon City

The Oasis Schoolyard Program transforms schoolyards into vibrant, climate-resilient, sustainable, and inclusive spaces. The initiative aims to create cooling hubs and educational environments that benefit not just students but also their families and surrounding communities.

The initiative is also being implemented in Semarang, Paris and Milan

Stresses

- Urban heat
- Limited access to green spaces

Shocks

-Flooding
-Heatwaves

Multipliers

- Climate resilience
- Education on heat management, climate change and ecosystems
- Improved wellbeing
- Community Cohesion

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Food security for climate action in Chennai

The Chennai Urban Farming Initiative (CUFI) is working to promote gardening on rooftops and vacant urban spaces across Chennai, India. They aim to build a sustainable and local food system, make healthy food more accessible, cool the city, and create jobs for vulnerable populations.

The initiative also partners with day cares and schools.

Stresses

- Urban Heat
- Food insecurity
- Lack of recreational and green spaces

Shocks

- Flooding

Multipliers

- Climate resilience
- Education on good nutrition
- Improved wellbeing
- Job creation

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RESILIENT CITIES NETWORK

Harvesting rainwater to tackle water scarcity in Guadalajara

The Nidos de Lluvia (Nests of Rain) program in Guadalajara installs decentralized rainwater harvesting systems in vulnerable neighborhoods, providing households with access to clean, reliable water sources during droughts and periods of water stress. Each system can store up to 2,500 liters of rainwater, which is filtered and purified for safe consumption.

The initiative has installed 8800 systems across the city

Stresses

- Droughts
- Water scarcity
- Water infrastructure gaps

Shocks

- Flooding

Multipliers

- Economic saving by minimizing water bills
- Gender equity
- Education on water conservation

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Is there a **resilience solution** you have worked on you want to share with us?

WRITE IN CHAT OR ANSWER BY RASING HANDS

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Questions



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Useful Resources for Resilience Building

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The City Resilience Framework

Helping urban areas to understand the complexity of resilience and the various factors contributing to it.

The CRF was developed by Arup a decade ago. It was used by all the R-Cities member cities to develop robust resilience stratehies

It is considered the key reference framework for holistic resilience.

Arup and R-Cities launched the CRF 2024 Edition in October 2024 to respond to the need of cities to adapt their resilience strategies to navigate the polycrisis



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Developed by ARUP

Urban Resilience Strategies

Resilient Cities Network have supported more than 90 cities worldwide develop and implement urban resilience strategies.

The strategy is a product of a process which unites people, projects, and priorities, and surfaces crucial new solutions so that cities can collectively act on their resilience challenges.

By fostering collaborative governance models, these strategies bring together stakeholders from diverse sectors to build comprehensive resilience.

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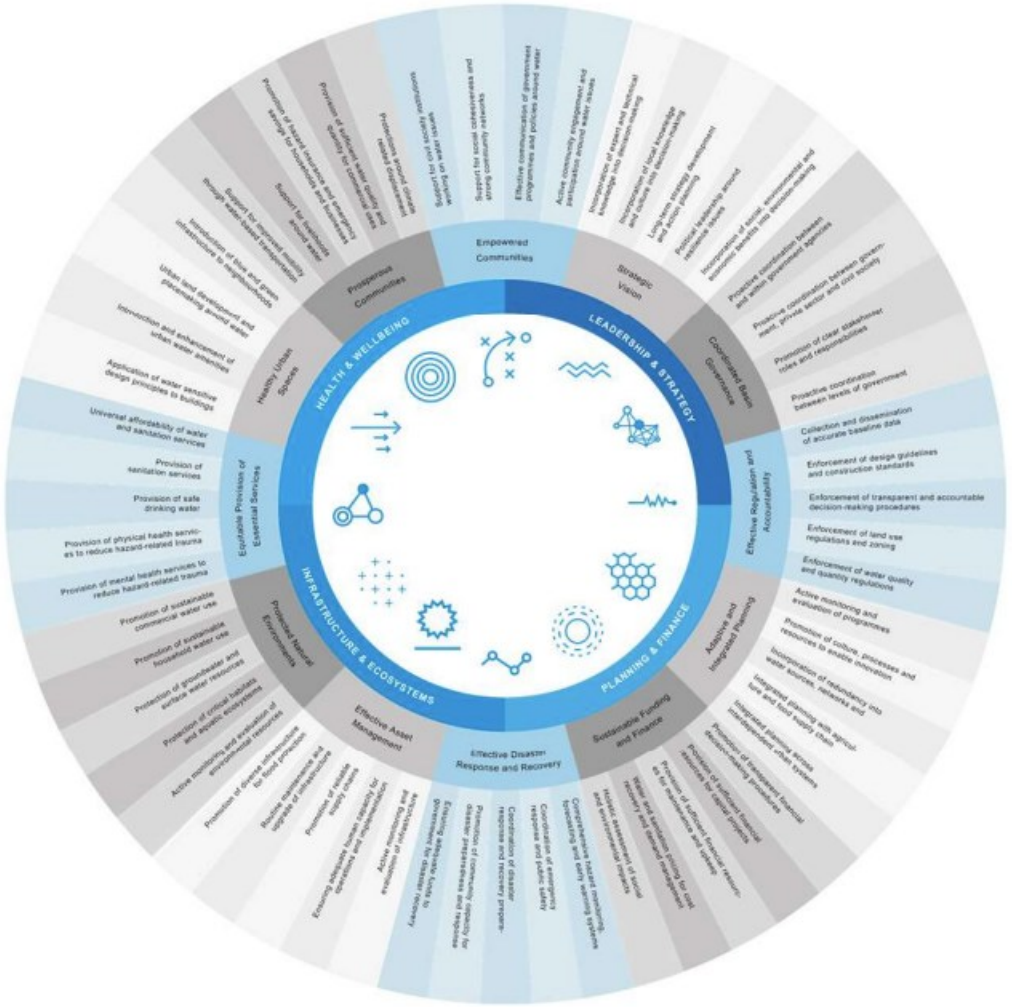

City Water Resilience Framework

The CWRF helps cities understand and improve their ability to plan for, manage, and recover from water-related challenges. It promotes integrated, inclusive, and adaptive water management by assessing resilience across key urban systems—such as infrastructure, governance, environment, and communities

It is a part of the **City Water Resilience Approach**, which supports long-term planning, encourages stakeholder collaboration, and helps cities prioritize actions to enhance resilience to floods, droughts, and water stress and has been implemented in cities facing water resilience issues across the globe including Lagos, Addis Ababa, Kigali and Cape Town

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City Energy Resilience Framework

The City Energy Resilience Framework (CERF) guides cities in applying a resilience lens to their power system and working toward their overall energy transition and urban resilience goals.

It incorporates key elements at the nexus of electricity infrastructure resilience, clean energy transition, equitable access to public services, effective emergency management and efficient recovery from shocks and stresses.

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The R-Cities Learning Hub

- The **R-Cities Learning Hub** supports cities, urban leaders and practitioners in their resilience-building efforts by **actionable tools**, **resources** and **examples from the ground**.
- The hub integrates **self-paced modules** and **cohort-based learning** to offer a more interactive and engaging experience.
- Our content is carefully crafted leveraging a **decade of experience** of our Network of 100+ cities and partners.
- **Access is subject to availability of spots**, if not please join the waitlist for our hub



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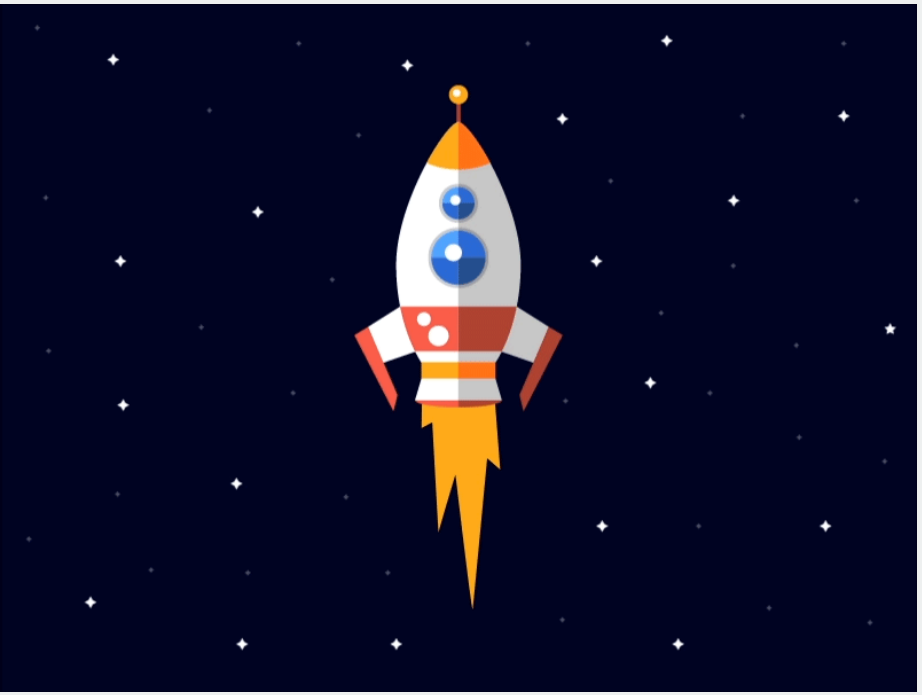
RESILIENT

AI Assistant





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Questions



What is **one key takeaway** for you from this lesson?

WRITE IN CHAT OR ANSWER BY RASING HANDS

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Key Takeaways

- We are in a **polycrises era**
- The challenges we face are **interconnected** and worsen one another
- We can still get ahead of these challenges and build a world that **survives**, **adapts** and **thrives** despite what we are faced with
- We are developing strong approaches and resources that enable us to be resilient!
- **We can be resilient!**



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ONBOARDING LEARNING PROGRAM

Session 3:

UNDERSTANDING CLIMATE RISK

Explore the risks of climate change and how to manage them effectively

DATE
June 4, 2025

TIME
9 AM GMT | 11 AM CAT
12 PM EAT

DURATION
1.5 hours

Climate Adaptation Services

RESILIENT CITIES NETWORK

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Online via ZOOM

FOR FREE



Next session!

Recordings will be posted on:
https://kenya.safe4allafrica.eu/

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Have a great day!

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