

THE CLIMATE RESILIENT INFRASTRUCTURE REPORT

**A FOCUS ON GENDER EQUALITY,
DISABILITY, AND SOCIAL
INCLUSION (GEDSI)**

ABOUT ICSI

The International Coalition for Sustainable Infrastructure (ICSI) was founded in 2019 by Resilience Rising, the American Society of Civil Engineers (ASCE) and its ASCE Foundation, the Institution of Civil Engineers (ICE), the Global Covenant of Mayors for Climate & Energy (GCoM), WSP and LA Metro, among others. We bring together a global coalition of change agents from across the engineering, investment, city, and philanthropic communities committed to bold action to solve the systemic problems that exist at the intersection of climate change, ecosystem degradation, ageing infrastructure, and underinvestment. ICSI is the global movement for engineering action on infrastructure sustainability, resilience, and climate change. We place engineers at the forefront of climate action, harnessing their ability to provide solutions and matching it with urgent demand. The solutions we develop and promote will deliver impact on the ground, where it is needed most. ICSI was created to bring the practical, science-based, and solution-oriented perspective for which engineers are known to solve the systems-level problems surrounding infrastructure underinvestment, climate change, and resilience.

From its origin, ICSI has been committed to driving action towards instilling sustainability and resilience as the cornerstone of every decision in the infrastructure lifecycle. Built upon a commitment to tangible and collaborative action, ICSI continues to broaden participation across other stakeholder communities to accelerate the innovation, adoption and scaling of people-centred, sustainable, and resilient infrastructure solutions that support sustainable development for all.

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WITH CONTRIBUTIONS FROM



Case study locations



Climate resilient infrastructure: A Focus on GEDSI

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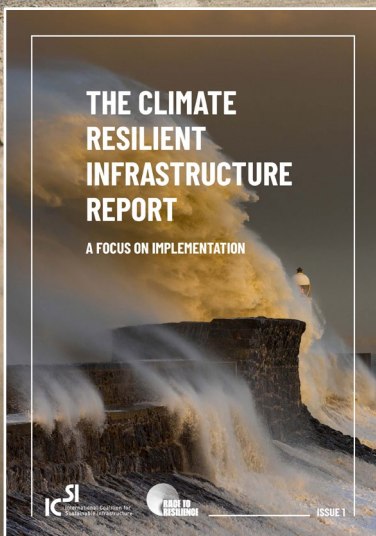
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About the Series

The Climate Resilient Infrastructure Report series was first launched in May 2023 to report progress on the state of climate-resilient infrastructure and showcase best-practice case studies and initiatives from around the world. The series contributes directly to the UNFCCC Race to Resilience campaign, which seeks to catalyse action by non-state actors to build the resilience of 4 billion people from vulnerable groups and communities to climate risks by 2030.

PREVIOUS ISSUES



[The Climate Resilient Infrastructure Report: A Focus on Implementation](#)



[The Climate Resilient Infrastructure Report: A Focus on Nature](#)



[The Climate Resilient Infrastructure Report: A Focus on Technology](#)

A Word from the Coalition for Disaster Resilient Infrastructure

Amidst increasingly frequent and intense climate and disaster events, the resilience of infrastructure systems is crucial to safeguarding lives, livelihoods, and economies. Infrastructure resilience cannot be achieved through engineering solutions alone, and true resilience can only be achieved when it is inclusive, accessible, equitable and responsive to the diverse needs of people.

Around the world, some population groups are more vulnerable to disasters and face differentiated impacts. Women, persons with disabilities, the elderly, youth, and marginalised communities often bear a disproportionate share of the loss and disruption that disasters cause. The design and delivery of infrastructure too often overlooks these vulnerabilities and the differentiated needs of access and usage. Resilient infrastructure has gender equality, disability and social inclusion (GEDSI) embedded at its core. It is a foundational principle that shapes every decision, from policy and planning to construction and management.

The Coalition for Disaster Resilient Infrastructure (CDRI) is a global partnership committed to strengthening the resilience of both new and existing infrastructure systems against the increasing risks posed by disasters and climate change. CDRI's approach to disaster risk reduction recognises that resilience is built not only through robust infrastructure and sound policies, but through inclusive processes that engage and empower the communities. Inclusive infrastructure strengthens resilience by engaging diverse stakeholders, valuing local knowledge, and ensuring that risk reduction efforts reach those most at risk. Integrating GEDSI principles reduces vulnerability, empowers communities, and fosters sustainable growth. CDRI's Infrastructure for Resilient Island States (IRIS) initiative embodies this people-centred approach. Launched at COP26, IRIS projects are co-created with partners and representatives from Small Island Developing States (SIDS), who face the compounded challenges of climate change, remoteness, and limited resources. Within IRIS, Outcome 3, 'Promoting Gender Equality and Disability Inclusion through Resilient SIDS Infrastructure' directly addresses the need to make resilience inclusive. Through strategic interventions in policy advocacy, equitable access, knowledge and capacity building, IRIS is helping to foster environments where social inclusion and resilience action reinforce one another.

CDRI is pleased to partner with ICSI for this report that strives to advance the global dialogue on inclusive and climate-resilient infrastructure, guiding governments and partners in integrating diversity and inclusion into policy, planning, and investment. As the world faces the cascading impacts of climate change and disasters, our shared task is clear: to create infrastructure that is not only resilient and sustainable, but also responsive to the needs of all.

Ranjini Mukherjee

Director - Research, Knowledge

Management and Capacity Development

Amit Prothi

Director General

A Word from the Global Covenant of Mayors for Climate and Energy

Climate risks are not gender neutral, nor do they affect all communities equally. As cities worldwide face the increasing impacts of climate change, it is important to recognise that social inequities, economic disparities, and systemic exclusion influence how different groups experience and recover from climate hazards.

Without intentional policies, adaptation efforts risk reinforcing or even exacerbating existing inequalities. Municipalities, regardless of size, are key to this process because of their proximity to communities, their knowledge of the local context, and because they oversee critical infrastructure, disaster risk management, and social services.

Historically, urban planning has prioritised broad infrastructure solutions without fully considering the structural, social and spatial factors that shape different levels of exposure to climate risks. Thus, consideration of GEDSI is critical to the design of future-proof urban infrastructure. By incorporating such principles, urban infrastructure can be designed to ensure everyone, regardless of vulnerability, has equal access to essential services and infrastructure. Moreover, inclusive design can strengthen financial sustainability by ensuring broader participation in user-fee systems and generating long-term returns that help the infrastructure pay for itself.

Integration of GEDSI principles throughout the project lifecycle remains inconsistent. The Global Covenant of Mayors for Climate and Energy (GCoM) is pleased to partner with ICSI on this report to help advance resilient and sustainable infrastructure.

The report highlights solutions that build community resilience and are rooted in holistic, inclusive, and transferable practices. It explores the role of participatory planning, highlighting the value of involving underrepresented groups in planning and design phases to ensure that infrastructure meets diverse needs, and looks at the need for disaggregated data to inform planning and how technology can advance accessibility and inclusion.

The resources are available; it is now the task of policymakers and practitioners to use them to inform decisions, strengthen participatory planning, and ensure our infrastructure meets the needs of all communities.

Asma Jhina

*Senior Advisor - Urban Climate Finance
and Inclusive Action*

A Word from the Race to Resilience

Women and persons with disabilities in vulnerable urban and rural communities understand better than anyone how infrastructure shapes their lives, during disasters and in daily routines. For generations, they have gone without investments that no community can deliver on its own.

As a Race to Resilience Global Ambassador and founder of Roof Over Our Heads, I am committed to supporting the voices of the most vulnerable communities, especially women and girls. Too often, their voices are left out of infrastructure planning and implementation; even though they are disproportionately affected by the climate crisis, they are among the last in the long queue to access these amenities and services. Placing people at the centre of resilience means utilising a GEDSI lens, and this report highlights how inclusive approaches not only safeguard lives and livelihoods but also unlock the creativity, wisdom, and leadership of communities themselves.

ICSI has played a powerful role in the Race to Resilience: convening engineers, policymakers, practitioners, and community leaders around a shared vision of infrastructure that is climate-resilient, socially inclusive, and responsive to the realities of those most at risk. The stories and initiatives featured in this report, from housing programmes in Dominica, to school reconstruction in Nepal, to Indigenous-led consultation frameworks in the Philippines, offer us key evidence of what is possible when GEDSI principles are embedded across the infrastructure lifecycle.

The challenge this report presents to us is to be smart, to integrate climate science innovations in engineering design, and to finance universal access to infrastructure. Most importantly, we need to understand that such investments produce a wide range of direct and indirect outcomes with both financial and non-financial impacts that must be quantified locally and globally to ensure broad adoption.

As we race together toward 2030 with the ambition of building the resilience of 4 billion people, this report serves as a reminder that the path to resilience must be people-centred, inclusive, and responsive to local contexts, while learning from global solutions. I invite policymakers, practitioners, and all stakeholders to draw inspiration from these examples and to scale solutions that prioritise dignity, equity, and justice for all.

Sheela Patel

*Global Ambassador of the Race to Resilience
& Founder of Roof Over our Heads*

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1. INTRODUCTION

We are excited to share the fourth issue of the Climate Resilient Infrastructure report, focusing on GEDSI. This issue highlights approaches, frameworks, and initiatives that embed inclusive practices into climate-resilient infrastructure.

Escalating climate hazards are intensifying inequities and placing millions at heightened risk of disrupted water, mobility, health, education, and safety. Climate-resilient development therefore requires infrastructure that is inclusive by design and performance. Positioning GEDSI across policy, planning, delivery, and operations advances the 2030 Agenda, anchored in SDG 5 (Gender Equality) with strong links to SDGs 9 (Industry, Innovation, and Infrastructure), 10 (Reduced Inequalities), 11 (Sustainable Cities and Communities), 13 (Climate Action), and 16 (Peace, Justice and Strong Institutions), and operationalises the four priorities of the [Sendai Framework for Disaster Risk Reduction](#) while safeguarding critical infrastructure. It also aligns with the [Paris Agreement's](#) call for climate-resilient pathways.

The work highlighted in this report has contributed to building and/or enhancing the resilience of over 36 million people worldwide.

This issue examines how GEDSI integration strengthens resilience by ensuring that the needs, priorities, and capacities of women, youth, persons with disabilities, and marginalised groups are reflected throughout the infrastructure lifecycle. Examples include participatory planning processes, inclusive design standards, equitable access to services, and targeted measures that reduce social vulnerability and enhance adaptive capacity before, during, and after hazard events.

The document showcases over 40 case studies and resources that embed GEDSI principles across the infrastructure lifecycle, from inclusive planning and co-design with women, youth, and persons with disabilities to accessible procurement, construction practices, and GEDSI-responsive operations and maintenance. It emphasises affordability, accessibility audits, and disaggregated performance indicators to better serve vulnerable populations.

Notable case studies include inclusive risk-management committees in Ecuador that strengthen community resilience, a low-cost 'Cool Bus Stop' in Ahmedabad that lowers heat and offers a scalable model for gender-responsive climate adaptation, and climate-resilient trail bridges in rural Rwanda that transform dangerous river crossings into safe access to schools, clinics, and markets, improving education, health, and economic outcomes.

This report aims to:

- Surface concrete entry points across the infrastructure lifecycle for delivering gender- and disability-inclusive outcomes;
- Illustrate how inclusive design and operations reduce vulnerability and accelerate recovery
- Provide adaptable checklists, indicators, and examples that practitioners can lift and localise
- Spur coalitions, engineers, planners, ministries, financiers, and community leaders to mainstream GEDSI in everyday decisions.

The featured contributions should serve as inspiration for practitioners, whether you are drafting a city drainage plan, upgrading health facilities, designing early warning dissemination, or writing procurement criteria. Utilise these case studies, knowledge products and initiatives to formulate more precise questions, allocate resources for inclusion at the outset, and support planning and development of climate-resilient infrastructure that serves the needs of all communities.



2. SPOTLIGHT ON GENDER EQUALITY, DISABILITY AND SOCIAL INCLUSION (GEDSI)

This report showcases how GEDSI is critical to the development of sustainable and resilient infrastructure. It frames the need for better integration of GEDSI throughout the infrastructure lifecycle and identifies ways for this integration to be actioned. It also explores disaster risk reduction and resilience for infrastructure through a GEDSI lens.



The role of infrastructure in delivering gender- and disability-inclusive outcomes for climate resilience

The climate crisis doesn't affect everyone equally, and existing inequities are compounded by hazards that disproportionately impact women, girls, persons with disabilities, older individuals, Indigenous communities, migrants, and low-income households. When a flood closes a bridge, unpaid care burdens rise, access to clinics is interrupted, and informal incomes collapse, reminding us that climate risk is not only about the wind speed, flood depth, or heat index but about who can still reach school, work, water, care, and safety when systems are stressed. Resilience, then, must be measured in access as much as it is in assets.

Infrastructure quietly decides who gets included in daily life. When assets are planned, financed, designed, and operated with GEDSI at the core, exposure can be converted into agency through safer mobility for caregivers and children, dignified water, sanitation and hygiene (WASH) facilities in schools and shelters, better accessibility for rural populations via trail bridges during rainy seasons, and inclusive disaster risk management (DRM) involving local vulnerable groups. In short, GEDSI turns resilience from slogan into practice.

Inclusive infrastructure builds resilience and supports adaptation by reducing differential vulnerability up front. It hastens recovery after shocks by ensuring localised, multi-channel early warning systems (EWS), accessible public buildings and transport, and meaningful participation of women in engineering, emergency management, and community networks. Case evidence shows gains from impact-based flood warnings, continuity of education through school retrofits, and upskilling women engineers, alongside community mapping that informs fairer decisions.



ADOPTING A LIFECYCLE APPROACH

The infrastructure lifecycle offers a useful framework to ensure that GEDSI considerations are embedded throughout the stages of project development, alongside climate and disaster resilience. From policy and planning through to operations and maintenance, below are some examples of how GEDSI can be integrated into the infrastructure lifecycle:

- **Policies, strategies, and plans:** mainstream universal design, set social-outcome targets, and require meaningful engagement with women, persons with disabilities, Indigenous peoples, and youth.
- **Standards and indicators:** adopt accessibility metrics, gender-responsive budgeting, and sex-, age-, and disability-disaggregated KPIs tied to service levels.
- **Planning and design:** co-create with representative groups; integrate wayfinding, lighting, ramp gradients, shade, privacy, lactation and hygiene spaces, and safe-route networks.
- **Procurement and delivery:** require supplier diversity, fair labour, and safeguards that prevent sexual exploitation, abuse and harassment; open pathways for medium, small and micro enterprises and social enterprises.
- **Operations and asset management:** maintain accessible alerts; keep essential services running for assistive devices and caregivers; use disaggregated data to improve service equity over time.

INTERSECTIONS WITH DRR

Disaster risk reduction (DRR) and disaster-resilient, inclusive infrastructure (DRI) are inseparable; people-centred DRI pairs multi-hazard risk models with real-world constraints such as mobility impairments and care burdens. Evacuation and shelter systems should include accessible WASH facilities, privacy, and protection from violence, while recovery should quickly restore essential services, from assistive devices to childcare. Systems thinking across roads, bridges, schools, clinics, communications, and energy is essential because when one node fails, social costs multiply.

Common shortfalls include weak enforcement of accessibility standards; social data that aren't sufficiently disaggregated or mapped to assets; limited participation from marginalised groups in decision-making; and financing that prizes speed over safety and inclusion. Practical fixes are available: align regulation with universal design and audit compliance; fund robust social and accessibility diagnostics at feasibility; require inclusive co-design and user testing; build local maintenance capacity with accountable budgets; and track outcomes that matter, e.g., warning receipt time for Deaf users, days of schooling lost by girls after floods, continuity of outpatient care for wheelchair users, and caregiver travel time under heat stress.

2.1 PROJECTS

The projects showcased here serve as best practices from across the globe. From data gathering efforts among marginalised communities to inclusive disaster response, these case studies each demonstrate ways that GEDSI has been considered in infrastructure solutions. Featured case studies elevate the agenda for resilience and adaptation across all infrastructure sectors and demonstrate the benefits of an integrated approach to GEDSI, linking the implementation of GEDSI activities to global frameworks such as the SDGs. The case studies all help to build progress towards implementation of the Sharm El-Sheikh Adaptation Agenda, and contributions to the Race to Resilience target have been highlighted where relevant.

BETIO HOSPITAL AND TUNGARU CENTRAL HOSPITAL MASTER PLANS

Sector



Buildings

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Coastal resilience

Community engagement

Community wellbeing

Healthcare

Green infrastructure

Project team

Jacobs; New Zealand Ministry of Foreign Affairs and Trade (MFAT); Government of Kiribati

Project start/completion date

2018 - Ongoing

Location

Republic of Kiribati

Communities impacted

Coastal

Hazards mitigated

Flooding (Coastal and Inland), Heatwaves, Drought

Provided By

Jacobs

Number of people made more resilient

60,000



Through a conceptual plan and a feasibility study, a collaborative design was developed to strengthen critical lifeline services for the Republic of Kiribati during extreme climate stressors, while prioritising assistance to vulnerable populations. Master plans were created for two hospital facilities: Betio and Tungaru.

ABOUT THE PROJECT

Kiribati is one of the most climate-vulnerable coastal nations, with most of its population living within 2 meters of sea level. This is compounded by being severely economically disadvantaged, as identified on the UN's list of Least Developed Countries. Kiribati's capital, South Tawara, is home to two critical hospitals, Betio and Tungaru. Due to the city's high population density, overcrowding is accompanied by public health issues, including high infant mortality, malnutrition, communicable diseases, mental illness, and domestic violence.

In 2018, with funding from the New Zealand government, Jacobs and Kiribati co-designed a master plan and conducted a feasibility study for infrastructure enhancements at both hospitals. Health system resilience and climate adaptation measures were central to the design. Key features of the hospital design include a flood-resilient structure with a raised ground level to mitigate sea level rise hazards over the coming decades. Rooftop rainwater harvesting systems were incorporated to address water insecurity during severe droughts, projected to intensify with climate change. Passive solar design and strategic landscape planning were used to create a cooler microclimate, providing safer environments for groups with increased susceptibility to heat stress and related health complications. Additionally, food gardens were integrated to promote food security, ensure equitable access to nutrition, and foster social cohesion through community participation.

Due to extremely limited land availability on the Kiribati atoll, the development of Tungaru Hospital – the main facility – was staged on the existing site to allow land reuse and to minimise environmental harm from construction. The new development also includes improved management of hospital waste (clinical and non-clinical) and prioritises natural ventilation to reduce energy consumption.

As part of an adaptive design, Kiribati started with an initial 'Phase 1' action to rebuild the smaller Betio Hospital inland, away from immediate threats from rising sea levels. Implementation took place between 2020-2024, ensuring continuity of critical infant and maternal care services while Tungaru Hospital remains under construction (the master plan for Tungaru is still under consideration for funding). Prioritisation of these services supports Kiribati's goal of reducing childhood mortality rates.

Throughout the planning process, Jacobs conducted an extensive stakeholder consultation and ensured that marginalised voices were heard. In many focus groups, women made up the majority of participants, reflecting their prominent roles in nursing and hospital management. Their input significantly shaped the master plans, and their needs were closely considered in the final design.

Once complete, the Tungaru hospital will enhance the health system across the island with a new emergency department, birthing rooms, maternity and children's wards. This GEDSI-inclusive approach to climate-resilient infrastructure will create comprehensive benefits by simultaneously protecting against climate-related health risks and promoting health equity – recognising that sustainable adaptation must address the social determinants that increase vulnerabilities to both climate impacts and health crises.

GEDSI-informed solutions are universal because they address root causes of climate vulnerability by systematically incorporating diverse perspectives and needs into resilience planning, minimising tradeoffs between adaptation and sustainable development.

INTENDED OUTCOMES

Social

The inclusion of climate and GEDSI considerations in the redevelopment of the hospitals would improve health outcomes across the island. In addition to improving maternal health, decreasing infant mortality rates and reducing levels of infections, the new hospitals will also lead to improved dignity for patients, better working conditions for those delivering care, and will significantly improve accessibility for people with disabilities.

Hospital master plan, Kiribati. © Jacobs



CLIMATE-ADAPTIVE AND INCLUSIVE POST-EARTHQUAKE SCHOOL RECONSTRUCTION IN NEPAL

Sector



Buildings

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Accessibility

Biodiversity

Community engagement

Education

Green infrastructure

Project team

United Nations Office for Project Services (UNOPS)

Project start/completion date

December 2018 - December 2022

Location

Nepal

Communities impacted

Rural

Hazards mitigated

Landslides, Heatwaves

Provided By



Number of people made more resilient

~11,000



Following the 2015 Gorkha earthquake in Nepal, UNOPS rebuilt resilient and inclusive schools to restore access to safe education. The project integrated gender, disability, and environmental considerations, promoting sustainable design, community ownership, and long-term educational resilience in disaster-prone areas.

ABOUT THE PROJECT

Following the 2015 Gorkha earthquake in Nepal, which destroyed over 7,500 schools, the government prioritised rebuilding resilient schools to ensure access to education for affected children. From December 2018 to December 2022, UNOPS, with the support of the Norwegian Embassy, implemented a project to construct 24 new schools across the Ramechhap, Sindhuli, Kathmandu, and Bhaktapur districts in Nepal.

This initiative delivered 144 classrooms, 26 accessible and gender-responsive toilet blocks, solar backup systems, fencing, and essential furniture and learning materials. Crucially, it also implemented adaptation measures that included earthquake-resistant structural design with higher seismic loading factors, thermally efficient construction techniques like rat-trap bond brickwork construction and composite PVC roofing for heat stress reduction, and slope stabilisation to prevent landslide risks, collectively ensuring safe, climate-resilient learning environments. Rainwater harvesting, composite roofing for noise reduction, and Packaged Sewage Treatment Plants (PSTP) were also incorporated to minimise environmental impact. Designed for durability, these schools have an estimated lifespan of over 50 years, ensuring access to education for future generations.

A community-centred and government-coordinated approach guided the project design and implementation. School selection involved close collaboration with the Central and District Level Project Implementation Units and alignment with national

post-disaster reconstruction priorities. Schools were selected based on their need, geographic vulnerability, and feasibility of reconstruction. The adoption of a cluster-based procurement model optimised material and labour management. Despite challenges such as extreme weather, poor road access, and COVID-19-related delays, the project was completed on schedule through adaptive planning and effective stakeholder coordination.

GEDSI principles were integrated through targeted measures and community engagement activities. Design choices prioritise inclusivity; for example, toilets were constructed with ramp access, incorporating features such as commodes, grab bars, and swing doors to meet the needs of and increase accessibility for children with disabilities. Improved disposal facilities for sanitary pads and other waste also address the specific needs of women and girls. Additionally, squatting pans for both females and males, and urinals in the male toilet, were installed.

To support learners with intellectual and physical disabilities, the project has procured tailored furniture such as wheelchair-accessible desks, soft flooring, and low tables. WASH facilities have been equipped with taps at varying heights to ensure accessibility for both young children and persons with disabilities.

Contractors were encouraged to hire women and local workers, with specific efforts to subcontract women-led teams for terrazzo flooring works. Furthermore, community consultations were conducted throughout the design and handover processes, with School Management Committees (SMCs) actively involved in developing maintenance and ownership plans. For example, in coordination with the SMCs and children, UNOPS provided waste segregation bins, water filters, Early Childhood Development classroom paintings, and play items using savings from accrued interest in the project. Discussions with contractors, construction workers, and other stakeholders were carried out to strengthen awareness of gender-based needs, rights, and inclusive practices. The project also ensured equal pay for all labourers, a commitment agreed upon by contractors.

The project ultimately advances inclusive education, environmental sustainability, and disaster resilience, safeguarding children's right to a safe learning environment. The schools serve as models for replicable, resilient, and inclusive infrastructure in disaster-prone regions, exemplifying holistic, transferable solutions aligned with SDG4 (Quality education), SDG 5 (Gender equality), SDG 10 (Reduced inequalities) and SDG 13 (Climate action).

Newly reconstructed, earthquake-resilient school in Nepal featuring inclusive and climate-adaptive design. © UNOPS



ACHIEVED OUTCOMES

Social

A total of 5,280 children gained access to safer and more inclusive learning spaces designed for sustained educational purposes. This includes 476 children with disabilities who now benefit from accessible infrastructure such as ramps, grab bars, and customised furniture. The construction of gender-friendly toilet blocks with incinerators for safe menstrual waste disposal has helped reduce school absenteeism among girls, contributing to the retention of adolescent girls in education. The decline in school dropout rates also helps reduce the risks of child labour, trafficking, and other persistent socio-economic challenges, contributing to safer and more resilient communities.

Approximately 11,200 workdays were provided to women through efforts to encourage contractors to hire female workers, ensure fair wages, and promote gender-sensitive workplaces. This was supported by orientation sessions and the implementation of inclusive labour practices. Moreover, SMCs received training on operations and maintenance planning, improving their ability to manage infrastructure and budget for upkeep through the School Improvement Plan and Annual Improvement Plan, thereby fostering local ownership and long-term sustainability.

Environmental

All schools incorporated green design and climate adaptation features to reduce heat stress, including rat-trap bond walling for thermal insulation, durable

terrazzo flooring, and noise-reducing, heat-resistant composite PVC roofing. Complete solar backup systems were installed in every school, promoting the use of clean, renewable energy sources, as well as rainwater harvesting systems and child-accessible water points, ensuring efficient and equitable water use.

Traditional septic systems were replaced with PSTP tanks, providing environmentally sound waste management solutions. Distributed waste segregation bins and water filters were also provided to maintain hygiene and support ongoing environmental awareness among students and staff.

In landslide-prone areas, erosion was mitigated and biodiversity promoted through slope stabilisation with vetiver grass and the planting of native tree species such as Ashoka and Dhupi.

Economic

Approximately 28,000 skilled and 112,000 unskilled labour days were created during construction, providing significant employment opportunities for local and female workers and contributing to improved community livelihoods.

By preventing educational disruptions and keeping 5,280 students in school, the project supports long-term economic growth. UNESCO estimates that each additional year of schooling can increase future earnings by about 10%; this educational retention translates into a substantial multimillion dollar increase in lifetime earnings for the students.

Local construction workers contributing to school reconstruction efforts. © UNOPS



INCLUSIVE SCHOOLYARDS IN GREECE

Sector



Buildings

GEDSI Elements

GENDER EQUALITY

SOCIAL INCLUSION

Highlights

Accessibility

Biodiversity

Community wellbeing

Education

Green infrastructure

Project team

URBANA

Project start/completion date

February 2022 - April 2023

Location

Greece

Communities impacted

Urban

Hazards mitigated

Heatwaves

Provided By

urbana

Number of people made
more resilient

640

[READ MORE](#)



The Inclusive Schoolyards project, led by URBANA, reimagines schoolyards through participatory, gender-sensitive, and climate-responsive design. By engaging children and teachers in co-design, it transforms traditional schoolyards into inclusive, ecologically aware environments that foster equity, social cohesion, environmental literacy, and climate resilience in urban contexts in Greece.

ABOUT THE PROJECT

The Inclusive Schoolyards project, led by URBANA and implemented to date in five schools across three Greek cities (Athens, Trikala, and Nea Philadelphia), places gender equality and social inclusion at the centre of educational infrastructure transformation. In many Greek cities, schoolyard design continues to prioritise competitive, high-energy play, such as team sports and rule-based games, while offering limited space for non-competitive, imaginative, or social activities. This narrow focus often reinforces exclusion based on physical ability, popularity, age, or gender, leaving children who do not engage in dominant play cultures, particularly girls and/or children with disabilities, without meaningful opportunities to participate.

To address these challenges, URBANA used participatory research and design tools for school communities, especially children and their teachers. These tools equipped students to become researchers of their own environments, mapping spatial dynamics, social hierarchies and gendered norms within their schoolyards. Climate awareness was integrated from the outset, encouraging children to share personal experiences and reflect on how environmental challenges shape their daily lives. Their insights informed a co-design phase, where students proposed spatial interventions to make their schoolyards more inclusive, accessible, and engaging for all. Building on this process, school communities

examined how low-tech, affordable, and ecologically sensitive design elements (e.g., shade, natural materials, and biodiversity) can enhance inclusivity while supporting thermal comfort, ecological health, and social cohesion.

A notable example is the transformation of the 93rd Primary School of Athens, where a previously unused area of the schoolyard was reimagined as a vibrant, shaded play zone. Wood was central to this intervention, selected for its ability to stay cool under sunlight and its ecological value in supporting microhabitats for insects and pollinators. Additional heat-mitigation measures included resurfacing the ground with a light-yellow material to reduce heat absorption and installing fabric shade sails to enhance thermal comfort. Similarly, at the 33rd Primary School of Trikala, benches installed around two plane trees created a shaded gathering area with a pleasant microclimate. These interventions demonstrate how climate-responsive design can promote equitable and

inclusive access to comfortable outdoor environments, especially critical in dense urban contexts like Athens and Trikala, where green space per resident is scarce, and schoolyards are increasingly recognised as essential climate shelters.

Inclusive Schoolyards is both a design intervention and a policy model. It offers an open-source methodology for reimagining school infrastructure as a platform for gender-transformative, socially inclusive, and climate-responsive urban change. Designed as microclimate shelters in response to rising heat, these spaces, though not yet open to the public, lay the groundwork for future community use. While past initiatives in Athens allowed schoolyards to host public activities beyond school hours, no such programmes are currently active. Opening them remains a political decision, but the vision is for these spaces to become shared neighbourhood resources, especially in dense urban areas where they may represent the only available open space. With institutional support for

Shaded play and gathering area created through the Inclusive Schoolyards project. © URBANA



access and governance, inclusive schoolyards can meet intergenerational needs and model equitable, climate-resilient design rooted in care-based urbanism.

Overall, the project relied on limited budgets, but carefully chosen, low-cost interventions had significant, demonstrable effects on daily life and social dynamics in the schools, while improving climate resilience.

ACHIEVED OUTCOMES

Social

Seven online workshops were organised to train teachers and support the rollout of educational activities. A total of 15 teachers were trained in the project's inclusive design methodology, while 125 students participated directly through focus groups and co-creation activities. In addition, approximately 500 students engaged in various educational initiatives across the five schools.

Ecologically sensitive elements transformed previously underused areas into some of the most visited spots in the schoolyards. Through low-cost, small-scale architectural interventions, these shaded zones are now actively used throughout the year, both during periods of extreme heat or rain, as comfortable spaces where children gather, talk and play, clearly demonstrating a shift in spatial use patterns and social interaction.

The project led to visible improvements in spatial equity, student well-being, and environmental literacy. Teachers observed that the schoolyard had gained an educational character and was used more equally and collaboratively by children of all genders and abilities. Students expressed a strong sense of ownership, with girls in particular reporting greater agency and inclusion.

Environmental

The installation of fabric shade sails, light-coloured surfacing, and tree-shaded seating areas enhanced cooling effects, particularly during heatwaves, turning previously overheated, unused zones into cooler, active spaces for gatherings and play. These low-cost, low-tech interventions contributed to reducing surface temperatures, while the use of wooden elements created small habitats that support urban biodiversity. By integrating sustainable materials, the redesigned schoolyards now function as microclimate shelters, offering cooler, more comfortable spaces during both extreme heat and rain. At the same time, these interventions served an educational role, raising children's awareness of ecology and climate adaptation.

DATA AND SYSTEMS FOR RESILIENT HOUSING PROGRAMMES IN DOMINICA

Sector



Buildings

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Carbon mitigation

Community engagement

Property protection

Project team

Build Change, CDRI (Coalition for Disaster Resilient Infrastructure), Dominica Ministry of Housing and Urban Development

Project start/completion date

January 2024 - December 2025

Location

Dominica

Communities impacted

Coastal

Hazards mitigated

Flooding, Cyclone, Landslide, Tsunami, Storm surge

Provided By



Number of people made more resilient

64,800

[READ MORE](#)



Using data on vulnerability of existing housing and systems for implementing housing retrofits, Build Change is increasing the resilience of climate-vulnerable housing stock across Dominica. Through developing guidance for homeowners and builders, as well as a government-led home-strengthening programme, the project will increase the readiness of vulnerable communities and their housing to withstand climate change impacts.

ABOUT THE PROJECT

Between 1993-2022, Dominica was the country most affected by the impacts of extreme weather events, according to the [Climate Risk Index](#). It is highly exposed to numerous geohazards, including earthquakes, volcanoes, and tsunamis, as well as meteorological hazards that are becoming more frequent and more destructive with climate change, such as hurricanes, flooding, storm surge, and landslides. In such a context, low-income housing constructions in Dominica are disproportionately vulnerable to the increased severity of natural hazards.

In 2018, the Government of Dominica acknowledged the existential threat climate change poses to the country and set the vision of transforming Dominica into the world's first climate-resilient nation. Recognising the risks posed to housing, a key target was set for 90% of the housing stock in Dominica to be built or retrofitted to resilient building codes.

Significant progress has been made with the construction of new resilient housing as part of recovery efforts post-Hurricane Maria and through government social housing programmes. However, less progress has been made in addressing the vulnerability in the existing housing stock, and data was not available to assess the scale of the problem or to inform potential solutions.

This project addresses the current gaps and challenges preventing Dominica from increasing the resilience of the existing housing stock by:

- Collecting data to determine a statistically viable baseline describing the condition of existing housing, against which the success and progress of improvement programmes can be measured.
- Developing guidance for strengthening and upgrading existing housing in Dominica that can be used by homeowners and builders.
- Designing a government-led home-strengthening programme to preventively mitigate the exposure of vulnerable existing houses to natural hazards and their increasing severity due to climate change.

This project has a systemic impact on Dominica's residential infrastructure: namely, 25,113 dwellings on the island, sheltering Dominica's official population of 72,000.

The project is establishing systems and tools based on objective Dominica housing data, international housing resilience and climate adaptation standards, and best practices. Using data collected on the vulnerability of existing housing from a survey of 527 homes, a robust understanding of the baseline condition of existing housing and its vulnerabilities was established. This allowed for the creation of a systematic approach to housing retrofits, based on a series of tools, including awareness materials and retrofit manuals, to improve the resilience of Dominica's housing stock.

This will dramatically increase the readiness of Dominica's housing stock to withstand the brunt of future climate-induced disasters, and increase the Government of Dominica's implementation readiness as it starts the implementation of a house-strengthening programme.

In this way, housing resilience solutions are mainstreamed, ensuring that they are tailored to the needs and particularities of every family in Dominica. Particular attention is paid to highly vulnerable families, including economically vulnerable households, ethnic minorities such as the indigenous Kalinago people, women and girls, women-led households, and the elderly. This was done by ensuring the housing vulnerability survey intentionally included respondents from these vulnerable groups, including over 50% women, and that data was disaggregated by gender and ethnicity, and included information about household income and persons living with disabilities.

The survey itself comprised four forms, including general information, socio-economic and demographic, site and surroundings, and a housing survey. This allowed the survey teams to work in parallel while at each house, with one person interviewing the homeowner to collect the socio-economic and demographic data, while others investigated the site and surrounding area, and others considered the structural and habitability conditions of the house. Houses were randomly selected by the field survey teams, based on targets for the number of houses in each parish and enumeration district, and the targets for housing typology, which had been established based on analysis of existing data. Teams of surveyors from the Ministry of Housing worked over the course of five months, from July - November 2024, collecting data digitally using Build Change's technical assistance platform, [BCtap](#).

The survey questionnaire and implementation were carefully designed to respond to GEDSI needs in Dominica:

- Over half (53%) of survey respondents were female. This was intentional to gain the perspectives of women, who play a critical role in household decision-making, particularly regarding housing needs, preferences, and priorities.
- 10.3% of survey respondents were from the indigenous Kalinago community. The Kalinago comprise approximately 4% of the total population in Dominica; however, they are a minority group that is particularly vulnerable to extreme weather and climate change due to their socio-economic status, geographic location on the eastern side of the island and dependence on the natural environment and resources.
- The proportion of survey respondents by parish is within 10% of the distribution of the general population by parish.
- The survey questionnaire included data collection on: the number and age of inhabitants, disaggregated by gender; the ethnicity of survey respondents; details of persons living with disabilities; and household income.
- Almost half (46%) of the surveyors hired were female, despite infrastructure work being traditionally male-dominated in Dominica.



© Build Change

Increased socio-economic vulnerability (e.g., poverty, social exclusion, insecure tenure) compounds physical vulnerability (e.g., unsound structures, riskier sites such as slopes and flood zones), which increases overall risk. After a hazard, the physical damage then feeds back and deepens socio-economic vulnerability. For example, low income, unemployment or multiple dependents limit a family's ability to invest in their housing. When analysing the survey data, the interaction between socio-economic and physical vulnerability was explored. This factor, referred to as 'increased socio-economic vulnerability', was defined as a household meeting three or more of the following criteria:

- Monthly income of XCD\$1,000 (USD\$340) or less
- Highest level of education: primary
- Unemployed
- Receives social security support
- Single-parent family
- Occupants with disabilities
- Occupants with chronic illness
- Poor condition of the dwelling
- Average space per person living in the house < 100 sq.ft

Based on this definition, 25% of households surveyed were considered to have increased socio-economic vulnerability in Dominica. This is consistent with the 2022 poverty rate of 28.8% reported by UN OCHA using Government of Dominica data.

The survey results will be used to develop a GEDSI-responsive retrofit programme design in 2025/2026. While this process is somewhat delayed, retrofits

on the five pilot houses are underway, with pilot beneficiaries selected based on GEDSI criteria that consider increased socio-economic vulnerability of the household. A second aspect of the retrofit programme is a write-up of recommendations for an at-scale retrofit programme for the Dominica context, available if and when funding for such a programme should become available. The team is exploring the possibility of designing a private-sector-led programme, partnering with credit unions to offer a home-strengthening loan product to their members. The hope is that such a programme would address GEDSI concerns by making loans accessible to rural households, households with informal incomes, the elderly, and other vulnerable populations generally excluded from accessing finance via commercial financial institutions. Build Change will also include a recommendation for partial or full grant funding for households with the highest socio-economic vulnerability. Another recommendation will be for grant-funded technical assistance to support households with financial literacy and retrofitting, as well as communications and awareness, and builder training and assistance. Women will be targeted as a priority group in these capacity-building efforts.

Centred around data and systems, this project will strengthen the Dominica housing stock, thereby naturally increasing the resilience of the house-based tourism market, enabling homestay hosts to protect their lives and capital, as well as the lives of their guests, and enabling rapid economic rebound following the next disaster. This strengthens the post-disaster business continuity potential of the Dominica tourism industry (a \$50 million industry) and of the island as a whole.

INTENDED OUTCOMES

Social

The Ministry of Housing and Urban Development (MoHUD) now has a statistically viable sample set of the existing housing stock that will be used as the baseline to prioritise investments in home improvements based on structural and household vulnerability, and against which the success of housing programmes can be measured.

Homeowners and construction sector stakeholders will have a set of technical resources that can be used to implement their own home-strengthening and improvement interventions, including a [homeowner awareness manual](#). Technical and construction supervision manuals are due to be published soon.

Ultimately, the development of a house strengthening programme, including systems and tools, will be designed and fully handed over to the MoHUD to strengthen existing vulnerable and damaged houses.

Environmental

While there are no direct environmental outcomes of this project, Build Change's [2023 embodied carbon study](#) has shown that retrofitting existing housing saves 18 metric tons of embodied carbon per house, as compared to building new.

The report notes that globally, retrofitting has the potential to save 48 gigatons of embodied carbon annually, while improving 268 million homes. The development and roll-out of an effective home-strengthening programme, facilitating the retrofitting and upgrading of Dominica's existing housing stock, will invariably have significant environmental benefits for Dominica by reducing the need for new construction on the island, thereby supporting significant embodied carbon savings.

Economic

The retrofit programme design work is ongoing and will include the development of a concept note for funding for the implementation of a home-strengthening programme. A successful home-strengthening programme will likely lead to significant economic savings for Dominicans, based on our knowledge of retrofit vs. new construction costs in Dominica. For example, 78% of galvanised roofs are highly vulnerable, but can be retrofitted for approximately XCD\$11,000 - \$16,000 (16% of the cost of new construction), and 89% of timber houses are highly vulnerable, but can be retrofitted for approximately XCD\$40,000 (37% of the cost of new construction).



DELIVERING RESILIENCE IN RWANDA THROUGH TRAIL BRIDGES

Sector

Other

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Accessibility

Capacity building

Community wellbeing

Livelihood protection

Mobility

Safety

Technology

Project owner

Government of Rwanda

Project start/completion date

2012 - Ongoing

Location

Rwanda

Communities impacted

Rural

Hazards mitigated

Flooding (Inland)

Provided By



**Bridges to
Prosperity**

Number of people made more resilient

1,100,000

[READ MORE](#)



Small-scale trail bridges in Rwanda are creating large-scale impact for gender equality, disability and social inclusion in rural communities. The construction of over 250 trail bridges across Rwanda's Land of a Thousand Hills provides access to essential services and has resulted in increased farm profits, improved literacy rates among women and an increase in school attendance among girls.

ABOUT THE PROJECT

One billion people in rural communities worldwide lack adequate access to transportation. In Rwanda, the second most densely populated country in Africa, 82% of its population lives amongst its green and hilly rural landscape, leaving 11.7 million people vulnerable to rural isolation during increasingly unpredictable and severe rainy seasons, resulting in loss of lives, livestock, and access to essential services such as education, healthcare, and markets.

The challenges faced are three-fold: First, women shoulder a disproportionate burden when it comes to transport and care for children and the household, in addition to generating income. Second, rural access is often overlooked as budget and focus are prioritised for urban planning, and last, climate change is hitting hardest for those who are already vulnerable and who contribute the least to the crisis.

The lack of safe, year-round access to basic infrastructure increases gender disparity. Women spend three times as much time on transport activities than men, taking 80% of the total time-cost of transportation for the household. In addition, more than 30% of rural households must cross a river to reach school, and girls are more likely to be kept home due to unsafe conditions.

To address this, Bridges to Prosperity (B2P) builds trail bridges in rural communities across the country. Trail bridges are more than just structures - they are systems of inclusion, resilience, and empowerment

that are life-changing for the communities they serve. Trail bridges reduce isolation and travel time, creating safe year-round access to markets, education and healthcare facilities.

Moreover, traditional crossings might require an individual to scale large rocks or boulders, balance on precarious supports (such as trees, logs or planks), or use significant physical strength (such as rope crossings). These informal types of crossing inherently bias able-bodied individuals and limit accessibility for both people with temporary disabilities (e.g. a broken leg) and permanent physical disabilities, as well as limiting mobility for children, the elderly, pregnant women, and any individuals with conditions that limit them from using traditional crossings. Trail bridge solutions that reduce travel time and make crossings safe and reliable for these communities in Rwanda have a compounded impact of disability inclusion by reducing these barriers.

The trail bridges constructed by B2P are relatively modest – typically spanning 30-150m, supporting communities between 2,000-10,000 people and harnessing circular economy principles by using donated cables from shipping ports to form the main cable elements.

The approach is community-driven: the need for a bridge is initiated by the village, escalated to local government, and supported by B2P through technical expertise, tools and equipment, and built using a co-funded financial model in partnership with the government. Bridges are co-constructed, employing 25-40 local community members, sharing technical skills and ownership. Once built, a bridge committee forms from the local bridge workforce to oversee maintenance under the ownership of the local government.

Creating a tech-enabled methodology, B2P has developed a suite of open-source digital tools, including [FikaCollect](#) for community members to report the need for a bridge, [WaterNet](#) to map 77 million miles of previously unmapped waterways using AI, and [FikaMap](#) to identify and prioritise bridge locations based on potential impact. Providing governments, the private sector and educational organisations free access to knowledge and digital tools is a powerful leveller to accelerate social inclusion and ensure that accessible infrastructure is provided for everyone.

Final touches being made on the 59m span Rusumo suspended bridge across the Nyirakibuye river in Rwanda's Rulindo district, serving a community of 4,340 people among the tea plantations of Northern Rwanda. © Envision



Although small-scale, the impact of trail bridges is far from modest. When this impact is scaled up, it influences systems change on a national and global level. B2P has, to date, supported the construction of over 700 bridges worldwide, of which 250 are located in Rwanda. In a first-of-its-kind randomised controlled trial, the effects of trail bridges are being quantified across 97 bridge sites and 10,000 households for bridges constructed in Rwanda between 2020 and 2024. Full results are due to be released soon, with the aim of quantifiably demonstrating the importance of rural access for one billion people in rural communities globally.

Right: A woman carrying dried branches for kindling and her son crossing Gasharu trail bridge in Rwanda's southern province.

© Robb Hohmann

Bottom: Three smiling school students at Cyarera suspension bridge, spanning 150m across the Mwogo river, which was previously only crossable by boat. © Bridges to Prosperity



ACHIEVED OUTCOMES

Social

Trail bridges are accelerators of social inclusion. New trail bridges led to a 60% increase in literacy among women and a 200% increase in school attendance for girls. Just one extra year of primary school sees a 10-20% increase in women's wages, of which 90% is typically invested back into the family, compared to 30-40% for men.

There are notable health impacts, too. Communities with new trail bridges are seeing a 45% increase in vaccination rates and a 32% increase in health facility visits that could otherwise have been delayed for several weeks while waiting for the water level in flooded riverbanks to subside. Maternal deaths reduce as travel time to clinics falls from hours to minutes, and bridges eliminate the dangers of being carried across rivers, restoring independent access to services.

Economic

Trail bridges have catalysed rural economic development: farmers see a 75% increase in profits due to year-round market access, and the number of women entering the labour force has risen by 60% due to reduced travel times and safe access. At the household level, families see a 30% increase in overall household income, whilst in Rwanda, the bridges themselves deliver a 49% annual return on investment, providing high value for both funders and communities. The model also creates short-term employment during construction and long-term opportunity by improving access to economic centres, education, and markets – creating generational change.

Two women from the local community of 6,600 people crossing the 105m long Gahira suspended bridge. © Robb Hohmann



OFF-GRID ENERGY FOR COMMUNITY RESILIENCE IN RURAL KENYA

Sector



Buildings



Power

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Capacity building

Carbon mitigation

Safety

Project owner

Practical Action Kenya

Project start/completion date

2014 – ongoing

Location

Kenya

Communities impacted

Rural

Hazards mitigated

Flooding, Heatwaves, Drought

Provided By

**SDS Lab**

SUSTAINABILITY AND DATA SCIENCE LAB

Number of people made more resilient

WEEK I - 250,000

WEEK II - 420,000

WEEK III - 582,000

[READ MORE](#)

The Women in Energy Enterprises in Kenya (WEEK) initiative provides off-grid energy to rural women, building local resilience through inclusive energy infrastructure and empowering women financially.

ABOUT THE PROJECT

In Kenya, migration or mobility patterns have been historically linked to economic hardship, un- or underdeveloped rural areas, and unreliable energy access. However, escalating climate risks are increasingly contributing to these pressures. Climate stressors like droughts, flood events, and extreme heat are influencing internal displacement patterns and vulnerable groups now face repeated and growing threats to their homes, community ties, and even livelihoods. In 2023, for example, over 600,000 people were displaced in Kenya from floods alone. Displacement and migration risks may disproportionately affect rural women, particularly those with limited financial independence and decision-making autonomy.

The Women in Energy Enterprises in Kenya (WEEK) initiative, led by Practical Action in partnership with ENERGIA, addresses many of these root causes by supporting rural women to become clean energy entrepreneurs. Funded by the Swedish International Development Cooperation Agency (Sida), WEEK provides women with necessary training, mentorship, micro-finance options, and connections to market leads.

The goal of this initiative is to produce and sell high-efficiency cookstoves, solar lamps, phone chargers, and biomass briquettes. WEEK funding supports the distribution of these technologies and sales, where participants receive training to become clean energy entrepreneurs. These products offer energy alternatives that function independently of the national power grid. This is especially important when considering off-grid and displacement-prone areas.

In regions facing repeated blackouts or lacking access to the grid, these solar and biomass products are helping homes remain functional and safe. WEEK helps women entrepreneurs gain financial independence while reducing community reliance on fossil fuels or unstable power infrastructure, improving community resilience against climate shocks. WEEK is now in its third iteration, expected to be completed by 2026. In previous iterations, WEEK's metrics have indicated strong improved resilience:

- **WEEK I (2014-2018)** – supported 294 women entrepreneurs and reached over 250,000 people.
- **WEEK II (2019-2022)** – supported 329 women entrepreneurs and distributed over 84,000 energy products, reaching over 420,000 people; worked with energy institutions to develop Gender Action Plans.
- **WEEK III (2022-2026)** – supporting over 400 women entrepreneurs and distributing over 112,000 clean energy products, reaching 582,000 people. Similar to WEEK II, this iteration is also developing and expanding Gender Action Plans.

Since WEEK II and continuing through WEEK III, the project has supported Village Savings and Loan Associations (VSLAs). These VSLAs have helped women mobilise important resources and strengthened local networks, improving both economic and social inclusion.

As Kenya continues to face severe climate-related displacement, especially in semi-arid counties like Embu, Meru, and Tharaka Nithi, WEEK provides a scalable adaptation model. Projects such as WEEK may help prevent climate-induced displacement before it occurs. When rural women become financially independent, access cleaner energy, and gain decision-making power, they are more likely to remain rooted in place. If migration is inevitable, however, these projects provide the skills necessary to better establish economic and energy independence. Clean energy mechanisms can reduce economic and environmental vulnerability, two major triggers for displacement in high climate risk regions. Empowered women entrepreneurs also strengthen community cohesion and are better positioned to support displaced neighbours.

The WEEK III project integrates GEDSI principles through a gender-transformative approach. It directly supports 402 women entrepreneurs, including women with disabilities, through mentorship, training, access to finance, and market linkages. Community engagement is central: the project collaborates with county governments in Embu, Meru, and Tharaka Nithi to promote gender-responsive energy policies, including waivers for women-led energy businesses.

Overall, WEEK provides a GEDSI-oriented, data-backed approach to building local resilience through inclusive energy infrastructure.





ACHIEVED OUTCOMES

Social

In WEEK III specifically, 402 rural women have been trained as clean energy entrepreneurs, including 64 in productive use of energy (PUE) sectors. 255 women reported that they make major household decisions now, while 152 women reported that they now make decisions on how to spend their business income. 89 women reported that they feel increased confidence in negotiating with market actors. Overall, most women in the programme have reported that they feel a growing sense of agency.

WEEK III's impact is institutional too; counties like Embu and Meru are adopting gender-sensitive energy policies, and some are waiving fees for women-led energy businesses to ease market access.

Environmental

WEEK III has helped reduce environmental degradation patterns. For example, the distribution of clean cookstoves can cut wood fuel usage by 30-60%. In these counties, deforestation has been the norm to access firewood and charcoal, so clean

energy alternatives mark a clear shift in positive environmental outcomes. In addition, this not only reduces CO₂ emissions and deforestation, but also limits the often unsafe methods by which women and girls procure firewood.

The project includes carbon mitigation efforts on a significant scale. This is through supporting sales of 112,769 clean energy technologies, like cookstoves and solar products. WEEK III helps rural households shift away from carbon-intensive fuels like firewood, kerosene, etc. This helps reduce CO₂ emissions, reduce deforestation, and lower the overall reliance on fossil fuels; a reduction in the use of such polluting fuels is also likely to improve health outcomes.

Economic

WEEK III has helped women entrepreneurs secure over \$27,000 in credit through various partnerships with financial institutions. They also created partnerships with seven clean energy companies. They also secured \$4,200 through the VSLAs. Together, the funds improved their energy enterprises, expanded their product reach, and ultimately established local financial resilience.

MOBILISIG – GEOSPATIAL NAVIGATION FOR INCLUSIVE MOBILITY & DISASTER RESILIENCE

Sector



Buildings

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Accessibility

Disaster Management

Safety

Technology

Project owner

University of Laval

Project start/completion date

2022 - ongoing

Location

Montreal, Canada

Communities impacted

Urban

Hazards mitigated

Flooding, Wildfire, Cyclone, Landslide, Heatwaves

Provided By



[READ MORE](#)

The MobiliSIG project uses mobile geospatial technology to improve social inclusion and quality of life for people with disabilities and an ageing population by providing them with information on the accessibility of infrastructure and services they need, thereby improving their social inclusion and resilience to climate hazards and disasters.

ABOUT THE PROJECT

Led by the Canada Research Chair in Senseable Cities for Empowered Mobility and the Liveable City Lab at Université Laval, the project offers an innovative approach to ensuring that people with disabilities are not left behind during daily travel or emergencies. Urban environments often present barriers such as stairs, narrow paths, and high curbs that restrict mobility and become life-threatening during disasters. Recognising this gap, MobiliSIG has developed a smart mobile geospatial application that provides accessible navigation for both everyday use and emergency evacuations. The team works on including dynamic factors in the application to deliver hazard updates and safe-route guidance, helping users avoid sudden obstacles and reach safety efficiently. The project leverages smart technologies such as sensors, Internet of Things, and crowdsourcing, as well as new opportunities offered by advances in GeoAI and predictive algorithms.

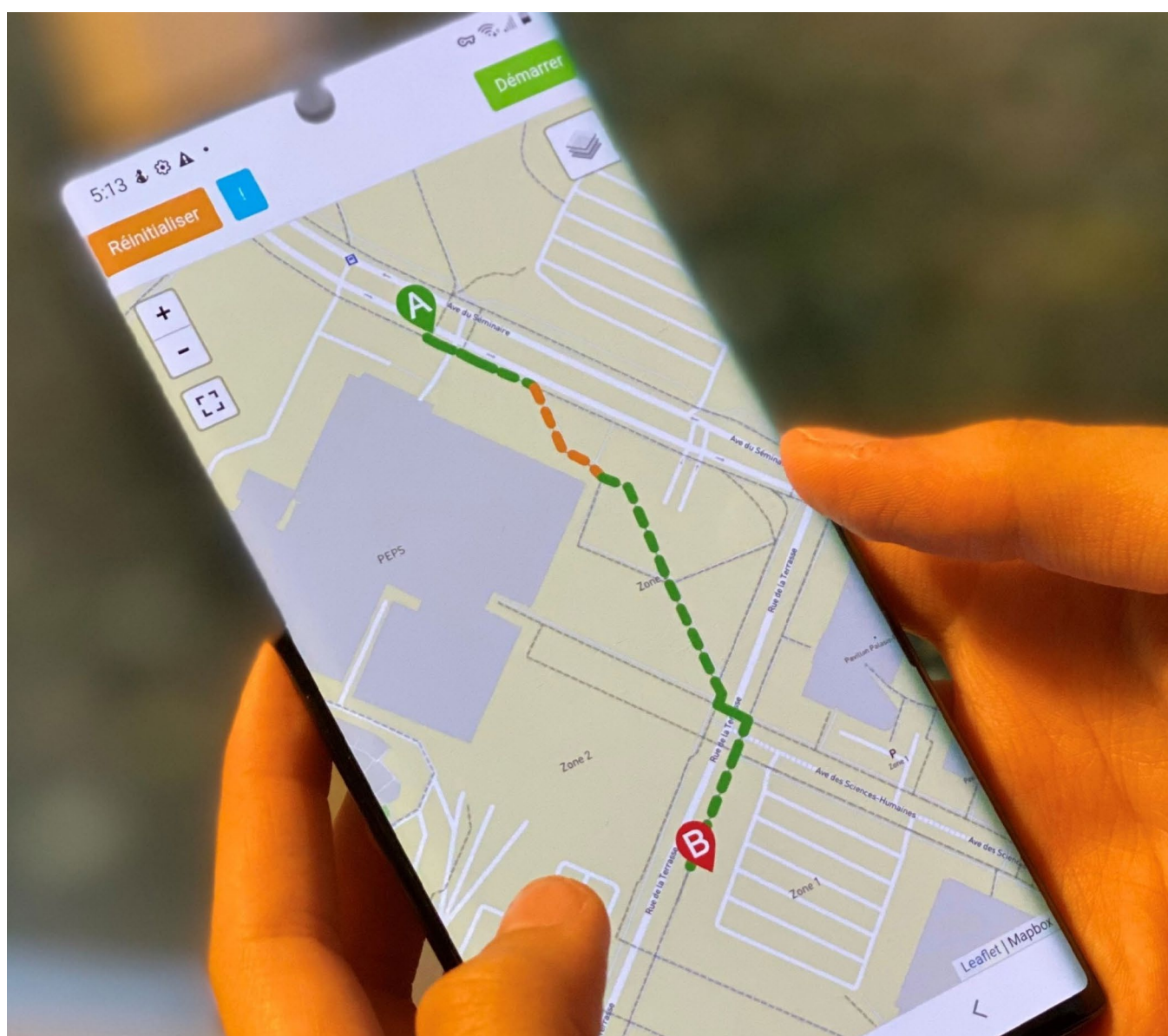
Central to the project is a community-driven design, where people with disabilities actively shape the technology to ensure it reflects real needs rather than assumptions. The app integrates inclusive multimodal communication features – visual, auditory, and haptic feedback – to support users even in high-stress or low-visibility situations. Beyond wheelchair users, the system benefits elderly individuals and others facing mobility challenges, extending its impact across vulnerable populations.

The initiative also attempts to respond to lessons from past disasters such as Hurricane Katrina, the 2011 Japan earthquake, and the 2023 Türkiye–Syria earthquake, which exposed how inaccessible transport and shelters heighten risks for disabled individuals. By combining geospatial intelligence with participatory design, MobiliSIG promotes both independence and resilience, allowing users to engage more fully in social and professional life while accessing safe evacuation routes in crises.

MobiliSIG demonstrates that true infrastructure resilience is not only about robust physical systems but about inclusive systems that ensure no one is left behind in times of crisis. The project's approach aligns with global calls for disability-inclusive DRR and showcases how digital innovation can strengthen equitable resilience in cities.

MobiliSIG is under continuous development and refinement, with new modules being created to support indoor accessible navigation and to address the needs of individuals with various types of disabilities (e.g., visual, hearing, and cognitive impairments). The first fully functional version, designed for wheelchair users, will be launched in Victoriaville, a municipality in the province of Quebec, Canada, in spring 2026. This pilot deployment will be used to further refine the application and prepare it for expansion to other cities across the country. The team is also exploring opportunities to commercialise the product in partnership with cities and local authorities, while ensuring that people with disabilities do not bear the cost directly.

User demonstrates the MobiliSIG app © MobiliSIG



USING TECHNOLOGY FOR INCLUSIVE PLANNING IN IOWA

Sector



Buildings

GEDSI Elements

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Accessibility

Disaster Management

Safety

Technology

Project owner

City of Perry

Project start/completion date

2020 – 2021

Location

Perry, Iowa, United States

Communities impacted

Urban

Hazards mitigated

Flooding, Cyclone

Provided By

Bentley®

Number of people made
more resilient

7,800

The City of Perry, Iowa, in partnership with Foth Infrastructure & Environment, used digital twin technology to enhance planning, support disaster preparedness, and promote inclusive and resilient urban development.

ABOUT THE PROJECT

Originally focused on assessing compliance of pedestrian ramp infrastructure with the Americans with Disabilities Act (ADA), the project quickly expanded into a citywide transformation. The team created a digital twin, which is a virtual, true-to-life graphic model of a physical asset, like a city. The purpose of this technology is to collect vast amounts of data in a fraction of the time required by traditional methods, creating a ready library of information that can be used for future planning, analysis, and management.

Leveraging solutions from Bentley Systems, including ContextCapture (now iTwin Capture), MicroStation, OpenRoads, and ProjectWise, the City of Perry created an interactive digital twin of over 60 miles of streets and 10 miles of alleyways. This became the first citywide digital twin in Iowa and one of the few in the Midwest.

By providing data to evaluate ADA ramp compliance and plan street networks that are functional for all users, the digital twin makes the community more accessible and safe for all residents, thereby promoting inclusive urban development. It empowers Perry to address infrastructure gaps and plan more equitably for all community members – including those with limited mobility and ageing populations. The platform helps in forward-thinking and smart planning, such as exploring autonomous transportation for residents with limited mobility and improving emergency vehicle response times for citizens in need.

[READ MORE](#)



The project also improves emergency preparedness and enables better protection for vulnerable groups through enhanced disaster resilience planning. The digital twin provides a broad view of all city assets, like trees and infrastructure, helping officials to identify areas of concern. This is crucial for securing funding for recovery after disasters like the 2020 derecho, as the twin's tree inventory helps document losses and prevents up to 75% of reimbursed funds from being lost.

By acting as a central repository for siloed information about various city assets, from traffic signs to green features, the city can use the digital twin to proactively identify infrastructure in need of repair and prioritise maintenance, thereby increasing the resilience of urban infrastructure and its users to a changing climate. It also saves staff time and reduces safety risks by allowing them to conduct desk studies instead of field studies.

This project exemplifies how digital innovation can enhance inclusion and resilience in small communities. Through inclusive planning, Perry is redefining what it means to be a connected, future-ready city.

ACHIEVED OUTCOMES

Social

The City of Perry's digital twin project, while rooted in technology, has significant social impacts that benefit the community's diverse population. The platform helped to prioritise upgrades that specifically benefit people with disabilities, elderly residents, and those with mobility challenges. This was achieved by integrating sidewalk, ramp, and right-of-way data into planning workflows, ensuring that infrastructure development reflects the needs of all residents, including underserved groups. The project also provided Perry's residents with digital tools and visualisations, allowing them to better understand and influence infrastructure decisions.

Additionally, the project also helped to preserve the cultural identity of the city by digitally preserving historic and community landmarks important to its diverse population. This supported community pride by making data on the nationally recognised Historic District readily accessible, aiding restoration efforts and adherence to preservation standards.

View of the 3D Mesh derived from the Digital Twin in ContextCapture, Downtown Perry, IA. © Bentley



Environmental

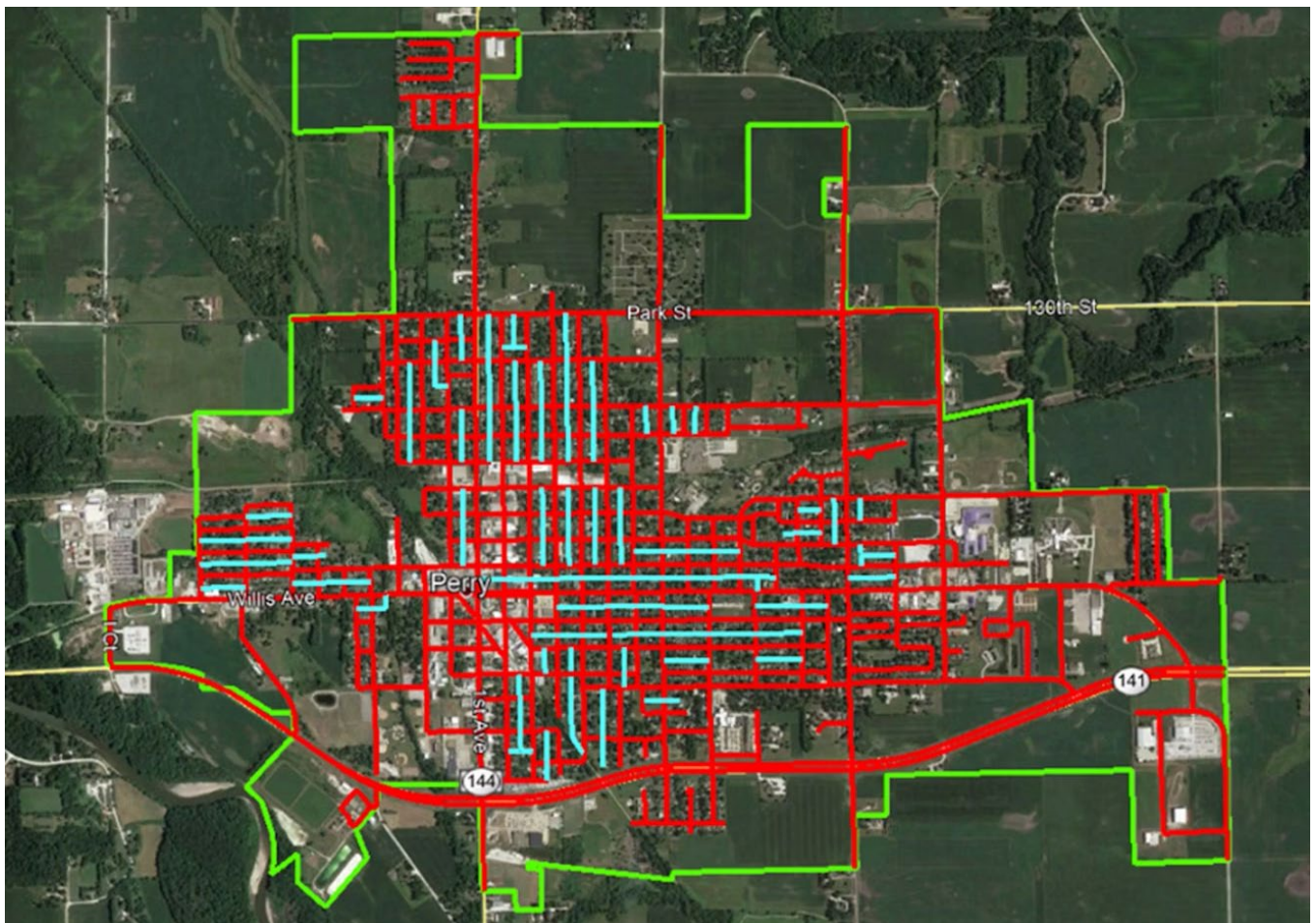
The digital twin includes a comprehensive tree inventory, which helps the city assess damage after severe weather and proactively manage against threats like the Emerald Ash Borer. It can also be used to simulate flood scenarios and analyse the effects of heavy rainfall, helping the city develop targeted protective measures and create more effective emergency response plans. The digital twin provides a basis for more sustainable urban development by helping city planners evaluate the environmental impact of proposed projects and optimise designs for efficiency.

Economic

The digital twin project created several economic efficiencies and benefits for the city. It was completed at the same cost as the original project, focused solely on ADA compliance (\$100,000), essentially providing a comprehensive city-wide digital twin at no additional cost. This investment is projected to help the city enact its Capital Improvement Plan (CIP) 60% faster, saving significant time and resources. Furthermore, the city anticipates that the digital twin will increase its ability to secure state and federal funding by 75%, and attract private investors to the historic downtown by providing them with a data portfolio, with the goal of increasing engagement by 50% over the next five years.

The project also improves historic building inspections by 25% and helps the city adhere to tax incentive programmes. The digital preservation of historic assets provides a portfolio of data for potential investors, removing the burden of a costly and time-consuming survey and making the city's historic district more appealing for development.

Map showing the 60 miles of roads (red) and 10 miles of alleys (cyan) that were scanned by the MLS vehicle to produce the Digital Twin. © Bentley



WOMEN FIRST RESPONDERS LEAD MAPPING FOR DISASTER RESPONSE IN SAINT LUCIA

Sector



Buildings



Coastal Protection and Adaptation

GEDSI Elements

GENDER EQUALITY

Highlights

Capacity building

Disaster Management

Safety

Technology

Project team

Humanitarian OpenStreetMap Team's Latin American and Caribbean Hub, Saint Lucia's Youth Emergencies Action Committee (YEAC)

Project start/completion date

October - December 2023

Location

Saint Lucia

Communities impacted

Coastal

Hazards mitigated

Flooding, Cyclone, Landslide, Sea Surge

Provided By



Humanitarian
OpenStreetMap
Team

[READ MORE](#)

As climate change exacerbates disasters in Saint Lucia, Humanitarian OpenStreetMap (HOT) is training women and girls in remote mapping skills to identify areas most at risk of climate hazards. This data collection informs evacuation plans and allows for improved responses during disasters, benefiting vulnerable groups and building local capacity.

ABOUT THE PROJECT

Vulnerable communities in Saint Lucia, a Small Island Developing State (SIDS) in the Caribbean, are increasingly exposed to climate change impacts, including intensified and unpredictable storms and serious risks from hurricanes, landslides, and sea surges. First responders experience challenges navigating disaster-affected areas due to a lack of an accurate and detailed map of Saint Lucia, delaying needed support to affected groups, such as women.

Building from a previous partnership with YEAC (Youth Emergencies Action Committee) Saint Lucia, the humanitarian arm of Caritas Antilles, HOT's Latin American and the Caribbean Hub launched this project with the goal of centring young women both as geospatial knowledge creators and users, covering an often-missed perspective in DRR and resilience.

Guided by two leaders, ten young women and girls aged 12-29 were trained in remote mapping, field data collection, and evacuation planning. Participants and volunteers mapped 5,705 buildings, labelled businesses in Gros Islet, and extended mapping to the towns of Choiseul, Urban Castries, and Bexon, gaining GIS and open mapping skills now applied to DRR.

Notably, the project recognised that traditional Western mapping concepts might not always align with how local people navigate. By asking people to indicate flood levels on their bodies (ankles, knees, hips) instead of estimated depths, the project gathered more consistent and relevant data that resonated with the community's language.

Through the project, trainees from YEAC gained access to critical data that can inform their planning on DRR initiatives. Saint Lucia also gained a group of skilled women mappers who continued and expanded mapping for DRR to different localities.

From the data captured, YEAC and community members are now able to identify areas prone to climate hazards and safer alternative evacuation routes. With the updated information, they can quickly and accurately locate people in need in times of disaster. In Bexon, for instance, a flood zone was identified where a bridge, which connects the population to safer areas, is effectively cut off during heavy rain.

The young women who participated are now teaching their peers, and some have become trainers, supporting other projects by training young persons, community members, and students. The project has also sparked interest from two district disaster committees seeking similar training. The skills acquired are now integrated into YEAC's broader activities, including risk assessments and donor reporting.

Inspired by other local youth groups, such as YouthMappers, and their experiences during this project, the group has moved into creating a Youth Champions for Emergency Mapping (YCEM) programme in the Caribbean region, pointing to a sustainable future for the initiative. The new YCEM has already taken its first steps by joining HOT's Pegasus Caribbean Project in partnership with the Caribbean Disaster Emergency Management Agency (CDEMA) and the University of the West Indies (UWI). This

research and learning initiative focused on providing wider training for youth, government, and NGO staff in open participatory mapping for resilience, and included providing executive briefings for decision-makers, highlighting the strategic role of mapping in resilience planning. The group also continued mapping in 2024, identifying emergency shelters in the community of Marc.

The YEAC team has also taken its first steps in developing and implementing its Vulnerability Triangulation and Targeting (VTT) Strategy in the same community, through which they aim to identify and allocate WASH interventions (training and relief items) to the most vulnerable individuals within the community. During the last months of 2025, they have been working on the initial acquisition process, in which they are cross-referencing Saint Lucia's Ministry of National Welfare List, which targets persons with severe poverty, illness, or a lack of familial support, with georeferenced locations that capture specific vulnerabilities on the ground (disability status, severe illness, household composition). Through the cross-referencing process, they assign a priority score based on the convergence of three factors: high hazard location, extreme household vulnerability (elderly/disabled), and severe WASH deficit. With this information, they expect to move into the targeted intervention phase in 2026, where they will deliver highly tailored WASH and relief aid based on the specific needs identified and integrate that information into the new YEAC Resilience Hub, ensuring that all future disaster response efforts can immediately prioritise the identified at-risk populations.



Participant digitising Field Data.
© Humanitarian OpenStreetMap Team

ACHIEVED OUTCOMES

Social

As a result of the project, 5,705 buildings were added to OpenStreetMap, an open and free geospatial database, and businesses in Gros Islet were identified and labelled. This baseline data can be used by governments and key stakeholders to identify vulnerable infrastructure and populations at risk of being impacted by climate change-related events, and inform key policy documents like Saint Lucia's National Adaptation Plan. Moreover, the inclusive participatory approach means that ten young women now have the technical skills and pertinent knowledge to build the foundation of a gender-inclusive climate resilience approach for DRR in the region. The benefits are continuing through the development of local project ownership and leadership, and women participants have continued mapping independently, becoming trainers and supporting other community projects.

Participants in the field. © Humanitarian OpenStreetMap Team



CLIMATE ADAPTATION IN ZAMBIAN TRANSPORT CORRIDORS

Sector

||| Roads and Highways

GEDSI Elements

GENDER EQUALITY

SOCIAL INCLUSION

Highlights

Green infrastructure

Mobility

Safety

Project team

Global Center on Adaptation (GCA) as part of a Technical Assistance from GCA to support the World Bank and the Zambia Road Development Agency (RDA).

Project start/completion date

April 2024 - January 2025

Location

Zambia

Communities impacted

Urban, Rural

Hazards mitigated

Flooding, Wildfire, Landslide, Heatwaves

Provided By



Number of people made more resilient

500,000

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This case study dives into an integrated approach to improve the efficiency, connectivity and climate resilience of Zambia's transport corridors and local communities. The project used the Spatial Inequality Tool (SPIN), developed by Haskoning, to identify and prioritise adaptation solutions that address climate risks, promote road safety, and are inclusive of vulnerable groups.

ABOUT THE PROJECT

As part of the Africa Adaptation Acceleration Program (AAAP), the Global Center on Adaptation (GCA) is providing technical assistance support to climate-proof the first series of projects under the Zambia Transport Corridors for Economic Resilience (TRACER) programme, being supported and financed by the World Bank, with the Zambia Roads Development Agency (RDA) as the implementation agency. TRACER's overall objective is to improve the efficiency, connectivity, and climate resilience of key regional transport and trade corridors in Eastern and Southern Africa. Under the programme, multiple road corridors are being renovated and developed.

Haskoning, in association with Lobelia Earth and Kiran & Musonda Associates (KMA), was appointed by GCA to undertake a climate risk assessment and adaptation investment prioritisation for road transport development in Zambia. The purpose of the technical assistance from GCA to the World Bank on this project was to support an integrated approach to enhance the resilience of Zambia's transport corridors and local communities, focusing on the Livingstone-Sesheke, Lusaka-Chongwe-Luangwa, and Serenje-Mpika transport corridors, and the Nakonde Border Post. The project involved analysing climate risks and opportunities to adapt upcoming investments and ensure accessibility to services provided through the transport corridors, to pinpoint main vulnerabilities and critical links within the rural, inter-urban and urban roads and to prioritise adaptation solutions that can mitigate these risks.

The transport corridors analysed play a vital role in regional and international trade. Disruptions, for instance, due to a flood event, can have large societal and economic impacts. Furthermore, the roads are also a part of local mobility, facilitating access to key resources and services amongst local communities and supporting societal functions for the Zambian population (Figure 1 shows the distribution of education and healthcare facilities along one of the transport corridors of interest).

However, fair access to education, healthcare, food or water is not always guaranteed due to urban-rural and gender disparities, and it often requires long-distance travel to reach certain facilities. As part of the assignment, Haskoning applied its in-house Spatial Inequality Tool (SPIN) to identify mobility patterns amongst the women population and to understand which routes facilitate the daily activities of women. It assessed how implementing climate adaptation measures could support access to the services provided through the transport corridors, road safety and inclusiveness.

The analysis showed that while gender-responsive rural transport has been identified as a critical catalyst for the development of rural areas in Zambia, there are still major gender inequalities in access to transport. Most vehicles are owned and used by men, and women often bear the brunt of agricultural and domestic responsibilities, leading them to stay close

to their households and resign from socio-economic opportunities that require long travel times and safe transportation.

Resilient and safe road infrastructure is necessary to promote women's economic inclusion and to provide safe access to vital services and resources, particularly in the critical road links identified (see Figure 2). Findings of the assessment have been presented to the beneficiaries and will be considered in the design phase to inform the best climate adaptation solutions.

Throughout the implementation of the project, there were several bilateral meetings and multistakeholder dialogues carried out with GCA, the World Bank, and local Zambian institutions. The purpose of these discussions was to validate the analysis on specific topics, understand the social impacts along the transport corridors, ensure the applicability of adaptation interventions to the local context of Zambia, and to align with the investment project and other ongoing initiatives in the country. Furthermore, during field visits to the location of the transport corridors, the consultant team engaged with community representatives to understand how they experienced the impacts of climate change.

As part of the implementation guidelines of adaptation options, it was recommended that specific household-level surveys be conducted to understand the local context of communities living along transport

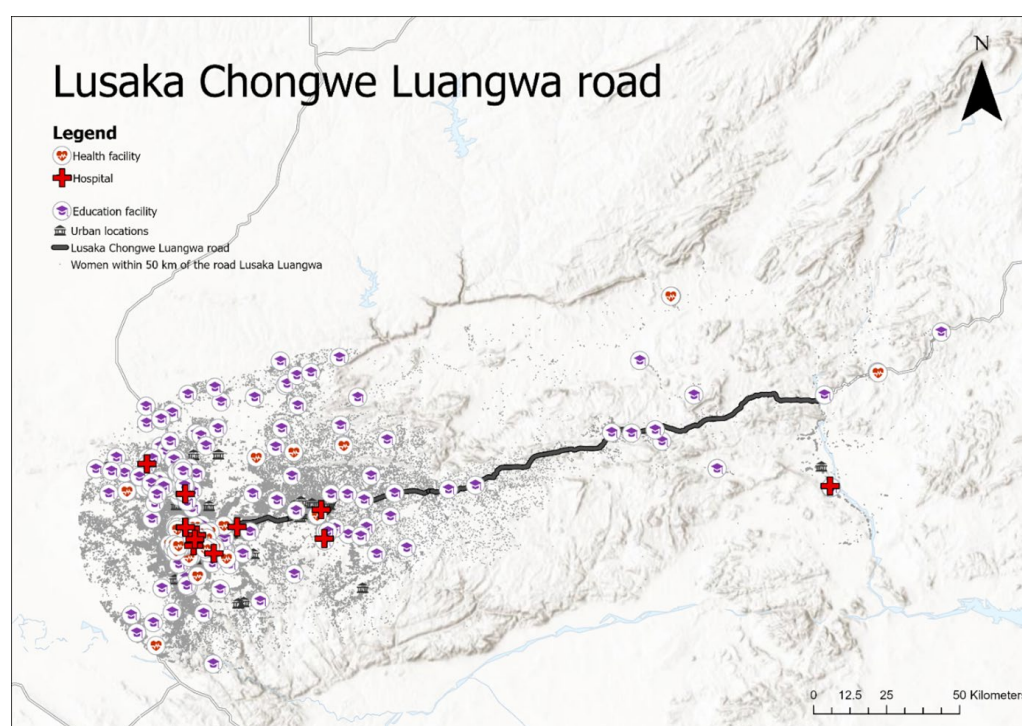


Figure 1:

Distribution of education and healthcare facilities within a 50 km buffer from the Lusaka-Chongwe Luangwa road. Source: produced with Haskoning's SPIN tool, based on OSM data. Available in the Climate Stress Test and Vulnerability Assessment Report for the Climate Adaptation Options Prioritization for the Zambia Transport Corridors for Economic Resilience (TRACER) Project (GCA, 2024).

corridors for the next stages of the development of the TRACER programme. The application of Haskoning's SPIN tool also raised awareness and interest for the development of a network analysis at the country level to inform the development of transport corridor programmes in the country.

The results of the assignment can be used to inform adaptation investment strategies for road rehabilitation planning, including specific components to ease the mobility of vulnerable groups. More broadly, the outcomes of the assignment are supporting efforts from the World Bank, assisted by GCA, towards resilience of communities through improved accessibility to transport corridors in Zambia.

INTENDED OUTCOMES

Social

The social outcome of the analysis was to provide insights into the extent to which men and women living around the vicinity of the roads are impacted (positively or negatively) by the deteriorating roads due to climate change. Through the census data, it was possible to identify that households use different means of transport, depending on their location (urban/rural). In urban areas, 14.3% of households have access to bicycles, 0.7% to animal-drawn carts, 1.6% to motorcycles or scooters, 11.7% to cars or trucks, and 1% to boats. In rural areas, on the other

hand, 47.7% of households have access to bicycles, 7.6% to animal-drawn carts, 3.4% to motorcycles or scooters, 3% to cars or trucks, and 3.4% to boats. The data helped us to conclude that most of the population along the transport corridors of interest is either non-motorised (thus they are dependent on walking, public transport or relatives) or their main mode of transportation is the bicycle. That makes non-motorised road users particularly exposed to the impacts of climate change and makes their travels dangerous when blended with heavy trucks and cars (see example in Figure 3).

Based on Haskoning's spatial analyses using SPIN, the team has identified visible differences between urban and rural mobility patterns. In urban areas, road infrastructure is more diversified and expanded, allowing people to make choices and use secondary roads to access services. However, rural communities are often dependent on a single main road that connects multiple villages. These communities often do not have the luxury of having their own educational or healthcare facility; instead, they need to share them and commute longer distances – often along main roads. The network analysis raised the need to promote inclusive road designs where non-motorised users have enough space to travel, where cars and trucks do not exceed speed limits, and where climate adaptation measures assure multidimensional resilience not only of roads but also of their direct surroundings.

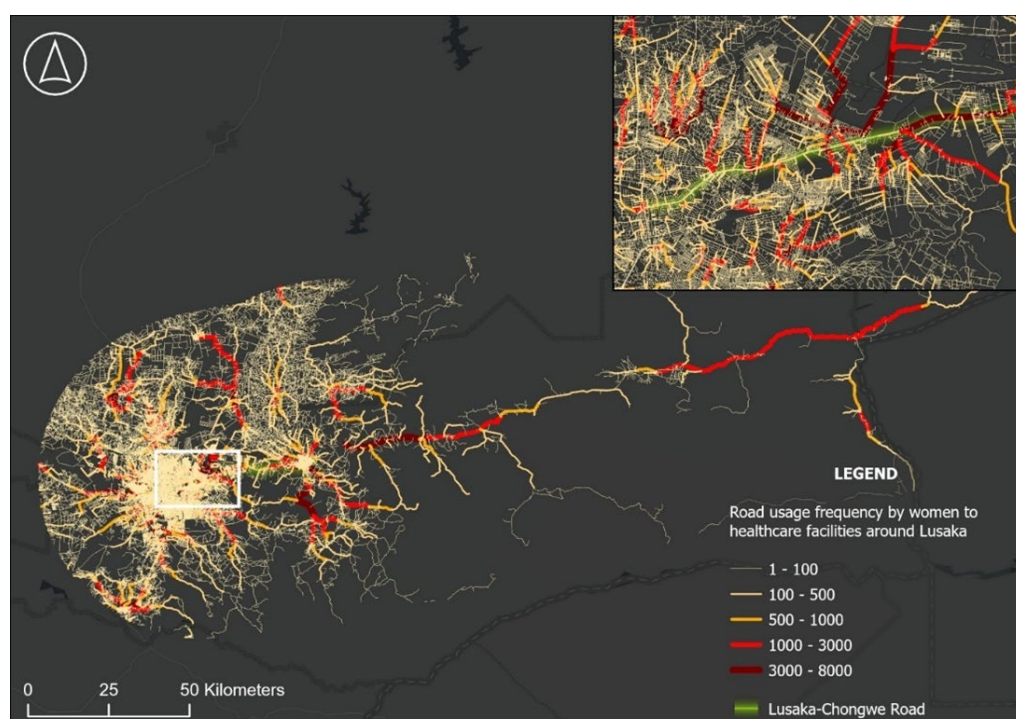


Figure 2:

Mobility patterns of women accessing education facilities within a 50 km buffer from the Lusaka-Chongwe Luangwa road. The map shows which road sections are most used for the purpose of accessing education.

Source: produced with Haskoning's SPIN tool, based on OSM data. Available at the Climate Stress Test and Vulnerability Assessment Report for the Climate Adaptation Options Prioritization for the Zambia Transport Corridors for Economic Resilience (TRACER) Project (GCA, 2024).

Environmental

Haskoning has specifically proposed a number of NbS considering efficiency in prevailing climatic conditions. They include:

- Active vegetation management to clear roadside shoulder and drainage;
- Roadside planting for sequestration, shade for the pavement and better dust control and microclimate;
- Thinning of grasslands to minimise the magnitude and spreading capacity of fires;
- Stone revetment at drainage outfalls;
- Bio-engineering slopes and embankments with vegetation reinforcement; and
- Water retention basins in the upstream areas to collect the flow at changing elevations.

Economic

The analysis showed that climate risks to the transport corridors vary depending on the geographical context and locations, raising the importance of having an integrated approach to support the resilience of Zambia's economy. This spatial variability of risks and existing initiatives for climate adaptation leads to varying levels of economic impacts.

Results showed that the measures integrated in the design of the Serenje-Mpika road section (i.e., heat-resistant pavement and improved drainage structures) were already considerably reducing climate risks, and the residual risk was limited. For the Lusaka-Chongwe-Luangwa and Livingstone-Sesheke road sections, it was observed that the costs of implementing adaptation measures were, respectively, between 20%-90% and 400%-700% more than the economic value of the quantified climate risks in just one year. This means that implementing these measures could be economically feasible over the asset lifetime, depending on assumptions taken, although with different payback periods and returns on investment for each transport corridor.

Figure 3:

Illustration of the daily mobility of population living along transport corridors in Zambia.
Source: Haskoning, during field visit to the Livingstone-Sesheke transport corridor.



THE COOL BUS STOP: BRINGING SAFETY AND DIGNITY TO AHMEDABAD'S COMMUTERS

Sector



Buildings

GEDSI Elements

GENDER EQUALITY

DISABILITY INCLUSION

SOCIAL INCLUSION

Highlights

Green infrastructure

Carbon mitigation

Mobility

Safety

Project team

Mahila Housing Trust (MHT)

Project start/completion date

October 2024 - March 2025

Location

Ahmedabad, India

Communities impacted

Urban

Hazards mitigated

Heatwaves

Provided By



MAHILA HOUSING TRUST
Towards Responsible Urban Development

Number of people made
more resilient

600,000

[READ MORE](#)



In Ahmedabad, India, the Mahila Housing Trust (MHT) retrofitted a bus stop with energy-efficient cooling technology, providing protection and dignity to populations vulnerable to heat stress during the summer months.

ABOUT THE PROJECT

As climate-induced extreme heat becomes the new urban norm, vulnerable populations – particularly informal workers, women, elderly persons, children, and persons with disabilities – face disproportionate exposure and risk. The Transport4All Citizen Survey (2021) conducted by MHT and Ahmedabad Municipal Transport Service (AMTS) highlighted that AMTS buses are the most widely used public transport mode in Ahmedabad, especially among low-income groups. Nearly 47% of respondents reported using public transport four or more days a week, emphasising the dependence of low-income households, women, and students on affordable bus services.

Yet, this reliance comes with significant discomfort. Long waiting times at bus stops emerged as the primary reason for an uncomfortable journey across both income and gender groups. For women respondents, the absence of shaded areas and prolonged exposure to the city's harsh climate made waiting particularly difficult. These findings highlighted the urgent need to make waiting areas not only more efficient but also safer, inclusive, and climate resilient.

In response, MHT engaged in community consultations, where women informal workers and elderly citizens stressed the need for cooler, shaded, and dignified waiting spaces.

To meet this need, MHT designed and implemented India's first Cool Bus Stop at Lal Darwaja, Ahmedabad's busiest public transit junction, in collaboration with the Ahmedabad Municipal Corporation (AMC) and AMTS, as part of the Ahmedabad Heat Action Plan. Insights from the community consultations directly shaped the design of the intervention, ensuring it addressed the lived realities of those most dependent on public transport.

Covering 135 sq. meters across two high-footfall platforms, the Cool Bus Stop serves thousands of commuters daily, reaching over 600,000 commuters during peak summer months. The majority of these commuters include women, gig workers, daily-wage earners, street vendors, students, and elderly citizens, many of whom endure prolonged waits under the sun without any protection, making the area extremely uncomfortable and unsafe during heatwaves, which can see temperatures exceed 40°C during peak heat.

The Cool Bus Stop addresses this urgent climate vulnerability by integrating energy-efficient cooling technology. While features such as shaded roofing, seating, and safe lighting already existed, MHT retrofitted the structure with a high-pressure misting system. Additionally, natural cooling elements like khus (grass) curtains provide breathable, fragrant cooling, enhancing the comfort of those waiting. Consequently, the Cool Bus Stop consistently maintains temperatures 5–7°C lower than surrounding bus stops. Smart features like an auto timer panel, water- and electricity-saving mechanisms, and dust suppression systems further enhance commuter comfort while improving air quality. Universal design elements, such as barrier-free access, comfortable seating, and adequate lighting, enable safe, accessible and dignified use by all.

Additionally, the location was strategically selected to prioritise local transit-dependent, low-income commuters who cannot afford air-conditioned waiting areas or private transportation, ensuring maximum benefit for those most vulnerable to heat stress.

The Cool Bus Stop is more than a heat-resilient public amenity; it is a people-centred, gender-responsive, and socially inclusive model of urban infrastructure. The entire installation was completed at a cost of just \$9,000, making it highly affordable and replicable for other cities. It presents an effective, scalable, and low-carbon solution for public transit infrastructure, enabling cities to adapt to climate change while addressing the lived realities of their most underserved populations with equity and dignity.

A second Cool Bus Stop in Ahmedabad has since been implemented in partnership with AMC and the Bus Rapid Transit System and there are plans to scale up the initiative across Ahmedabad. Furthermore, local authorities from Baroda and Indore have approached MHT to replicate the Cool Bus Stop model in their cities, reflecting growing interest in sustainable and climate-resilient urban infrastructure.

Commuters wait at Ahmedabad's Cool Bus Stop.
© Mahila Housing Trust



ACHIEVED OUTCOMES

Social

Designed with safety, inclusivity, and comfort at its core, the Cool Bus Stop supports the physical and emotional well-being of diverse groups and responds to the gendered realities of public transport use. Women commuters benefit from shaded and safer waiting conditions; elderly persons and those with limited mobility find the cooler, dust-free environment supportive of their health; and informal workers gain relief from heat stress during long waits.

By offering a safe and inclusive waiting space, the intervention directly supports gender equity and social inclusion in public infrastructure, and improves public health by reducing prolonged exposure to extreme heat.

Environmental

The Cool Bus Stop is built using a high-pressure misting system, an energy-efficient technology that enhances commuter comfort by minimising heat absorption and contributing to lower ambient temperatures during peak summer months. This system delivers localised cooling while consuming significantly less electricity (75–88% less) than traditional air conditioning, making it a more sustainable alternative. It also features automatic functions, including a timer panel and integrated water- and electricity-saving mechanisms, ensuring efficient operation and resource conservation. Additionally, by making public transit more comfortable, the intervention encourages continued reliance on buses rather than private vehicles, indirectly supporting modal shift and lowering per capita transport emissions. Its dust-suppression features also contribute to improved air quality in dense urban corridors.

Economic

By improving commuter comfort, especially during peak summer months, the structure supports productivity and income stability for informal workers who rely on public transport. It also contributes to public health savings by reducing heat-related illnesses, which can lead to medical expenses and lost workdays. As a durable and low-maintenance model, it minimises long-term infrastructure spending, while its energy-saving measures also result in reduced operational costs.

MAINSTREAMING GENDER-RESPONSIVE CLIMATE RESILIENCE IN INFRASTRUCTURE INVESTMENTS

The Global Center on Adaptation (GCA) helps integrate climate resilience into infrastructure projects by engaging early with governments, multilateral development banks (MDBs), and the private sector. Through the Africa Adaptation Acceleration Program (AAAP), GCA promotes early climate adaptation in infrastructure, shifting from reactive rebuilding to proactive, inclusive, and resilient planning. Currently, more than 70% of GCA projects are gender-responsive and tailored to local climate and socio-economic contexts.

GCA's infrastructure projects across Africa are designed to demonstrate how climate resilience, gender mainstreaming, and inclusive development can be embedded at scale. Through its interventions, GCA engages with diverse stakeholders to ensure that every project is informed by robust climate data, socio-economic analysis, and participatory planning.

The projects span multiple sectors, including:

Transport: Climate-resilient road corridors and regional connectivity projects that reduce vulnerability to floods, extreme heat, and landslides while promoting inclusive access to socio-economic infrastructure.

Water and Sanitation: Flood-adaptive urban drainage systems, resilient water supply networks, and nature-based solutions (NbS) for water management that protect communities and ecosystems.

Urban Resilience: Cities and towns that are being strengthened against climate risks through green infrastructure, DRM, and inclusive urban planning.

Energy: Renewable energy and power distribution projects that are climate-informed and socially inclusive, ensuring reliability and access for vulnerable populations.

Through AAAP, GCA has provided upstream technical

assistance, including climate risk screenings, spatial vulnerability assessments, socio-economic analyses with gender analyses, and the integration of nature-based and hybrid solutions. Below are two examples of how GCA has been mainstreaming gender in climate-resilient infrastructure investments across the portfolio.



Gender-Responsive Climate-Resilient Transport Corridors in Burkina Faso

Sector

||| Roads and Highways

GEDSI Elements

GENDER EQUALITY

SOCIAL INCLUSION

Highlights

Education

Healthcare

Livelihood protection

Mobility

Project team

Global Center on Adaptation

Project start/completion date

2025 - ongoing

Location

Burkina Faso

Communities impacted

Urban, Rural

Hazards mitigated

Flooding, Wildfires, Cyclones, Landslides, Heatwaves

Provided By



GLOBAL
CENTER ON
ADAPTATION

Number of people made
more resilient

2,000,000

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ABOUT THE PROJECT

The World Bank Group Burkina Faso Sikasso-Korhogo-Bobo-Dioulasso (SKBo) Basin Integration Project aims to strengthen multimodal connectivity and bolster sub-regional value chains and trade within the SKBo region. Phase 1 focuses on infrastructure development, including roadworks along the RN11 Banfora-Sidéradougou-Ouo corridor (115 km), enhancing cross-border mobility and economic integration.

Beyond the economic benefits, transport connectivity has deep social implications. In Burkina Faso, women face compounded vulnerabilities linked to education, household responsibilities, and social risks such as forced marriage and domestic violence. These structural inequalities already limit their opportunities for employment, education, and market access, and these challenges intensify when transport systems break down. When roads are disrupted, whether by flooding, drought, or heat stress, schools and health services become harder to reach. Girls are more likely to drop out of school and face early marriage, while women's unpaid care and health burdens intensify.

At the same time, agriculture and trade in cotton, mango, rice, maize, sorghum, and cowpeas are highly dependent on a functioning road network. Climate projections under RCP 4.5 and RCP 8.5 scenarios show sharp reductions in road availability, which would drive up food prices, disrupt trade chains, and undermine food security. For women, who play critical roles in both production and trade, these combined pressures increase economic precarity and social vulnerability.

Through AAAP, GCA applied network-level climate risk screening and gender vulnerability analysis to the SKBo transport corridors. By overlaying hazard projections with indicators such as women-headed households, enrolment ratios, forced marriage, and domestic violence, the analysis identified geographic hotspots where climate risks and gender inequalities converge. This methodology showed how infrastructural climate proofing is directly linked to safeguarding women's rights to education, mobility, and healthcare, making resilience-building both a technical and a social justice imperative.

HIGHLIGHTS

- Hotspot mapping highlighted areas in Cascades and Haut-Bassins where climate-related road disruptions intersect with high gender vulnerability, such as low school enrolment for girls and high rates of domestic violence. This evidence helps direct adaptation to where gendered risks are most acute.
- Targeted Corridor Resilience highlighted priority investments in drainage, slope stabilisation, and climate-adaptive road materials to safeguard critical trade routes. This evidence helps direct adaptation to where disruptions most threaten mobility and access to essential services.
- The measures also improve food security and trade protection through quantifying the risk of losing hundreds of kilometres of trade routes under RCP scenarios, highlighting the importance of climate-proofed corridors to stabilise food supply chains and protect women's agricultural livelihoods.

This project illustrates how integrating climate analytics and gender-responsive planning from the outset ensures infrastructural durability while positioning transport corridors as a strategic lever for inclusive adaptation, food security, and equitable socio-economic transformation in Burkina Faso.



Inclusive Corridors: Building Climate-Smart, Gender-Equitable Connectivity in Djibouti

Sector

||| Roads and Highways

GEDSI Elements

GENDER EQUALITY

SOCIAL INCLUSION

Highlights

Accessibility

Capacity building

Community engagement

Green infrastructure

Mobility

Project team

Global Center on Adaptation

Project start/completion date

2024 - ongoing

Location

Djibouti

Communities impacted

Urban, Rural

Hazards mitigated

Flooding, Wildfires, Cyclones, Landslides, Heatwaves

Provided By



Number of people made more resilient

267,598

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ABOUT THE PROJECT

The Djibouti Regional Economic Corridor (DREC) project in Djibouti aims to improve regional connectivity and economic development while addressing climate vulnerabilities and socio-economic and gender inequalities along key transport corridors, ensuring that women, youth, migrants and people with disabilities benefit equitably from both the infrastructure and the opportunities it creates.

GCA combined a climate stress test with a participatory gender assessment to capture how climate risks intersect with local mobility patterns, community dynamics, and socio-economic vulnerabilities. The analysis highlighted the reliance of women, youth, migrants, and people with disabilities on the corridor for access to health, education, markets, and basic services, and identified the risks they face during service disruptions.

Drawing on these insights, recommendations were developed to guide the integration of adaptation measures into preliminary design, improve access to basic services such as lighting, water points, GBV-safe spaces, health and education facilities, and support resilient livelihoods through road and rest area maintenance jobs, upgraded market facilities, and climate-smart training and tools to diversify incomes.

HIGHLIGHTS

- By explicitly considering gendered mobility needs and socio-economic inclusion, project planning informed inclusive design and construction. This approach strengthened stakeholder capacity, promoted participatory processes, and ensured the provision of safe, accessible rest areas and livelihood opportunities during works.
- The early integration of ecosystem-based approaches, such as vegetated swales and floodplain management, reduced long-term climate risk while creating co-benefits for local communities. Through participatory design processes, these NbS ensured that diverse user needs were reflected and that vulnerable groups gained equitable access to ecosystem services.

- GCA's technical guidance supports local authorities in strengthening procurement processes and resilience-focused decision-making, building local capacity. By embedding gender and social inclusion criteria into standards and procedures, it also enhanced institutional capacity to deliver infrastructure policies that are socially inclusive and responsive to the needs of marginalised groups.

This project demonstrates how integrating climate adaptation with gender-responsive interventions in road corridors reduces vulnerabilities, safeguards essential and ecosystem-based services, and creates pathways for more inclusive and sustainable development.

ACHIEVED OUTCOMES

Social

Mainstreaming gender-responsive climate resilience into infrastructure projects has enhanced the inclusivity and safety of transport and road corridor developments. In Burkina Faso, results show that climate-induced transport disruptions, mainly flooding and landslides, affect up to 333.7 km of road corridors under RCP 8.5. Departments such as Mangodara, Sidéradougou, Sindo, and Samôgôgouan recorded moderate to high gender vulnerability, linked to low female school enrolment, high dependency on agriculture, and elevated rates of forced marriage and domestic violence.

By keeping corridors open, rural livelihoods and women's access to essential services are protected, reducing the risks that deepen gender inequities.

Moreover, resilient corridors lessen time and care burdens that fall disproportionately on women, while strengthening their opportunities to participate in local economies and decision-making within households and communities. Integrating gender analysis into climate-resilient transport planning ensures that adaptation investments that consider the mobility needs of women, youth, and elderly groups can reduce social vulnerability and strengthen community resilience to climate shocks.

In Djibouti, corridor interventions that prioritised gender-informed consultations and community engagement ensured that women and vulnerable groups were included in planning and design. These approaches reduced the risks of GBV during travel, fostered greater women's participation in decision-making, and strengthened social cohesion. Importantly, engaging women in construction and maintenance activities provided temporary livelihoods and improved their inclusion in community development processes.

These experiences show how mainstreaming gender into climate-resilient infrastructure turns transport corridors into platforms for equity, safety, and inclusion. Beyond mitigating risks, such approaches strategically position infrastructure investments to deliver wider social transformation, empower marginalised groups, and ensure that adaptation generates lasting socio-economic impact. In practice, this demonstrates GCA's approach to embedding both climate resilience and gender inclusion into upstream design and decision-making, so that investments are climate-proofed and gender-proofed for long-term sustainability.



Environmental

Gender-responsive infrastructure resilience measures also contributed to positive environmental outcomes. In Burkina Faso, the SKBo technical assessment prioritised grey engineering measures and provided examples of NbS for flood mitigation, including the [Green Roads for Water](#) approach, which integrates bioengineering techniques into road design to capture and store runoff, promote infiltration, and reduce erosion. Women's mobility and access to essential services are highly affected by road disruptions and environmental degradation. The adaptation measures ensure that environmental resilience efforts also advance gender equality and inclusive community development.

In Djibouti, gender-sensitive planning emphasised safe water points and shaded areas along the corridor, indirectly supporting water resource management and reducing ecosystem degradation from unmanaged use. Together, these interventions reinforced the role of ecosystems in building long-term climate resilience. This demonstrates the added value of linking climate-proof infrastructure with long-term ecosystem stewardship across Africa.

Economic

The economic benefits of gender-responsive resilience are substantial. In Burkina Faso, analysis shows that under the RCP 8.5 scenario, the probability of road disruptions increases by 300% compared to RCP 4.5, with 333.7 km of roads at risk, compared to 110.2 km. These disruptions raise transport costs for traders and farmers, with women – key players in local trade and agriculture – disproportionately affected. Integrating climate and gender considerations into corridor investments supports livelihoods, value chains, and inclusive, resilient growth.

In Djibouti, interventions such as creating local markets near transport hubs and integrating women into road maintenance generated new income streams and improved household resilience to climate shocks. By addressing structural gender inequalities, infrastructure investments not only reduced projected climate-related damages but also unlocked additional economic value, contributing to a more resilient and inclusive growth pathway. Together, the portfolio demonstrates that gender-responsive adaptation unlocks resilience dividends that multiply both social and financial returns on investment.



ROADS4PEOPLE – BUILDING RESILIENT RURAL ROADS, EMPOWERING COMMUNITIES IN CÔTE D'IVOIRE

Sector

||| Roads and Highways

GEDSI Elements

SOCIAL INCLUSION

Highlights

Accessibility

Capacity building

Carbon mitigation

Green infrastructure

Livelihood protection

Technology

Project team

ORIS, UNIDO, Government of Côte d'Ivoire

Project start/completion date

2025 - ongoing

Location

Côte d'Ivoire

Communities impacted

Rural, Coastal, Other

Hazards mitigated

Flooding, Wildfires, Cyclones, Landslides, Heatwaves

Provided By



Number of people made
more resilient

31 Million

[READ MORE](#)



Through collaborative action, Roads4People in Côte d'Ivoire improves the climate resilience of rural roads as 'critical links' – lifelines for communities and supply chains. By strengthening these roads, the programme safeguards livelihoods, secures food supply chains as well as critical links, and empowers rural communities to participate more fully in the economy.

ABOUT THE PROJECT

Côte d'Ivoire is one of the fastest-growing economies in West Africa, with agriculture as a key driver, contributing 27% of national GDP. Cocoa and coffee are the country's main industrial and export crops, forming a central pillar of the economy, alongside cashew, rubber, palm oil, cotton, banana, mango, pineapple, and sugarcane.

The road network is vital for moving agricultural goods from production zones to agricultural hubs, Bouaké and Korhogo, and then to the ports of Abidjan and San Pedro for export. Within the transport network, rural roads are especially important: they connect farmers to markets and also link communities to schools and health centres, supporting both livelihoods and basic services.

However, Côte d'Ivoire's roads are in poor condition, and less than 10% of the national network is paved – well below the West African average. Many become impassable in the rainy season and are highly vulnerable to flooding and extreme heat. Chronic underinvestment in maintenance and limited use of digital tools for planning add to the problem. Climate change further worsens these weaknesses: Côte d'Ivoire ranks 142nd of 182 countries on the [Notre Dame Global Adaptation Initiative Index](#) (ND GAIN), indicating high vulnerability and low readiness.

Rural communities are particularly affected by these challenges. In 2020, only 60% of the Ivorian population lived within two kilometres of a road that is usable

year-round, according to the National Development Plan for 2021–2025. This limits economic growth and access to value chains, while also affecting food security, access to education and health services, and poverty reduction. The lack of reliable connectivity falls most heavily on women, persons with disabilities, and marginalised groups, who depend on safe rural roads for their livelihoods and daily needs. Better access can also reduce the time women spend on unpaid domestic and care work, while strengthening agricultural supply chains supports women's empowerment, as 42% of women in Côte d'Ivoire work in the sector.

The Roads4People programme tackles these challenges through an innovative, digital methodology that integrates climate resilience, socio-economic priorities, and inclusivity into road planning. A partnership between the United Nations Industrial Development Organization (UNIDO), technology firm ORIS, and the Government of Côte d'Ivoire, the programme introduces tools for assessing, prioritising, and planning both major and rural road investments.

The initiative reflects the [Life-Links Framework](#) – a practical and forward-thinking approach where partners co-develop and co-invest in solutions that make critical transport links in supply chains more resilient and sustainable. This builds a transparent, data-driven basis that enables government, private sector, and community actors to collaborate on building a climate-resilient road network that is connected with global food supply chains. Roads4People embodies the Life-Links vision that global supply chains can drive climate action and local development – benefiting communities, companies, countries, and consumers alike.

Using advanced analytics, Roads4People evaluates road vulnerabilities and models climate risks at both the road and network level. This is then used to measure the impacts on mobility and accessibility for both people and goods transportation. Next, adaptation measures are selected from the ORIS Global Adaptation Database, which contains more than 700 international best practices. These adaptation measures strengthen infrastructure against flooding, heat, and other climate risks, improving overall climate resilience. Examples of measures are climate-appropriate materials (such as heat-resistant asphalt), improved drainage, raised road sections or culverts to manage flooding, and NbS.

In parallel, opportunities to reduce greenhouse gas (GHG) emissions are identified and integrated.

The methodology also integrates social impact indicators – such as access to schools and health services or reduced travel time for rural households. This ensures that the proposed adaptation solutions also deliver equitable benefits. Communities are directly involved in identifying priority rural road interventions, linking resilience with inclusion.

Moreover, the project builds institutional capacity, with national road authorities being supported to adopt climate resilience and social inclusion approaches in line with international best practices and frameworks, including the EU Taxonomy for sustainable infrastructure investment, and to deploy digital solutions and make data-driven decisions for road planning.



By combining digital tools, AI, and financing innovation, the programme delivers a comprehensive approach: strengthening infrastructure against climate impacts while minimising GHG emissions, expanding access to essential services, building capacity, and keeping rural communities connected to national and global supply chains.

Roads4People partners aim to broaden collaboration with development actors and the private sector to safeguard the 'critical links' that connect people, markets, and supply chains.

OUTCOMES

Social

Roads4People empowers vulnerable communities by enhancing the livelihoods and social inclusion of rural populations, especially women, ethnic minorities like the Voltaic/Gur and Northern Mandé, migrant workers, and other marginalised groups. Enhanced connectivity also means that rural communities will benefit from better access to services, markets, and supply chains, contributing to economic participation, food security, and social inclusion. Moreover, adaptation measures based on recommendations from the International Road Assessment Programme have led to improved road safety.

Environmental

Project measures will decrease GHG emissions by around 10% through leveraging the digital platform's advanced algorithms and carbon lifecycle assessment (LCA) methodology to compare alternative designs for road infrastructure, leading to a pre-emptive reduction in emissions. Natural resource extraction is also reduced by about 8%, as the platform's multi-factor assessment analyses material choices and resource efficiency to optimise the design. This leads to concrete engineering decisions, such as recycled materials or more heat-resistant surface materials and foundations, improving durability and reducing the overall need for raw materials and future maintenance.

Economic

Roads4People has already seen tangible economic benefits, for example, pavement structure construction costs have been reduced by an average of 6%. In addition, the project promotes sustainable financing through supporting the creation of a Rural Roads Fund, a national financing mechanism that reinvests savings from optimised major road projects into rural road maintenance, rehabilitation, and expansion.



A FOCUS ON PORTS

Port resilience is crucial for keeping global trade moving and protecting economic stability. There are over 17,000 ports around the world, employing more than 30 million people and supporting countless livelihoods. Yet their position at the interface of land and sea also makes them highly vulnerable to the mounting impacts of climate change.

This section highlights tangible actions being taken by port actors around the world to make their infrastructure and operations greener and more resilient to climate change, while integrating GEDSI considerations throughout.

GENDER INCLUSION AT THE PORT OF TANJUNG PELEPAS

Sector

 Seaports

Highlights

Capacity building

Job creation

Location

Malaysia

Provided By



The maritime industry faces mounting pressure to demonstrate both environmental stewardship and operational excellence whilst addressing persistent gender disparities in a traditionally male-dominated sector. Malaysian ports are pioneering an innovative approach that demonstrates how gender mainstreaming initiatives can simultaneously advance climate resilience, operational efficiency, and community development. These ports illustrate that diversity and environmental sustainability are not competing priorities but complementary strategies that strengthen both human and environmental capital.

The Port of Tanjung Pelepas (PTP) in Johor exemplifies how gender mainstreaming can advance both operational excellence and environmental objectives. In 2021, PTP launched a Female Employee Referral Programme offering monetary incentives for employees who refer potential female candidates, with the goal of increasing female representation to 30% of staff. These recruitment efforts target roles directly linked to port equipment operation, maintenance, and logistical support. These functions prove critical to the port's transition towards greener and more resilient operations. As PTP has invested significantly in low-emission and electrified port technologies, women operating heavy machinery such as electric prime

movers, yard cranes, and hybrid Rubber Tyred Gantry cranes contribute directly to emissions reduction goals and operational resilience.

Beyond environmental benefits, PTP's gender mainstreaming approach strengthens socio-economic resilience by creating equitable employment pathways and raising household incomes in local communities. These economic improvements prove vital for climate adaptation, as financially stable communities are better positioned to invest in climate-smart practices and respond effectively to environmental disruptions. By integrating women into technical and engineering roles, the port helps to diversify the local economy and reduce vulnerability to socio-economic disruptions, including those triggered by climate-related trade fluctuations.

PTP's pioneering appointment of Malaysia's first female marine harbour pilot symbolises the broader transformation occurring within the traditionally male-dominated maritime sector. Through targeted initiatives, including the Female Terminal Operator Fast Track Up-Skilling Programme and the Young Development Programme for fresh graduates, which encompasses apprenticeships for engineers, technicians, and IT specialists, PTP expands the talent pipeline for green and digital port technologies. Women are progressing from operational roles to positions in maintenance, digital systems, and automation, thereby supporting the port's low-carbon transition.

The port's community engagement in Gelang Patah further promotes socio-economic resilience through youth and women's entrepreneurship programmes that incorporate sustainability-related skills training in areas such as sustainable logistics and waste management. These initiatives foster a green entrepreneurial ecosystem whilst equipping local populations with adaptive capabilities to address climate challenges. By empowering local women with skills aligned to green growth, PTP indirectly builds climate resilience at the community level, ensuring long-term sustainability in maritime zones increasingly vulnerable to sea-level rise, extreme weather, and supply chain disruptions.

This integrated approach extends beyond PTP. At Port Klang, Westports Malaysia encourages women's participation in operational and technical roles through education and training programmes incorporating green port operations, including sustainable supply chain management, waste reduction, and renewable energy literacy. These initiatives support environmental objectives whilst building the human capital necessary for climate adaptation. By ensuring women and youth are equipped to participate in emerging low-carbon port ecosystems, Westports strengthens local capacity to navigate economic and environmental transitions.

Similarly, Northport (Malaysia) Bhd. promotes women's participation through capacity-building initiatives focusing on skills development, leadership training, and career progression. Northport fosters an inclusive work environment where women contribute significantly across diverse functions, from operations to corporate strategy, and their growing presence in management and technical roles enhances operational efficiency, sustainability, and innovation. Women leaders at Northport are actively engaged in workplace initiatives, digital transformation projects, and environmental sustainability efforts, embedding

climate-smart thinking into port operations through energy-efficient systems, green logistics, and carbon management.

Through their corporate sustainability commitments, Malaysian ports demonstrate that gender equality functions not merely as a social objective but as a strategic enabler of climate resilience. By integrating women into green technologies, innovation ecosystems, and community development, these ports strengthen both human and environmental capital. This approach aligns with global priorities for inclusive climate action, gender-responsive adaptation, and just transitions in key sectors, illustrating that gender inclusion and climate resilience constitute mutually reinforcing pillars of sustainable maritime development.

Research increasingly supports this connection. The World Bank emphasises that gender-responsive employment and inclusive participation in infrastructure sectors contribute directly to climate and disaster resilience, as gender-diverse workforces enhance institutional adaptability, strengthen community preparedness, and promote equitable distribution of benefits from climate investments.



INCLUSIVE DEVELOPMENT IN JOHOR'S PORT COMMUNITIES

Sector

 Seaports

GEDSI Elements

SOCIAL INCLUSION

Highlights

Biodiversity

Capacity building

Coastal resilience

Community building

Education

Waste reduction

Project owner

Johor Port Authority (JPA)

Project start/completion date

2024 - Ongoing (Target Completion in 2027)

Location

Johor, Malaysia

Communities impacted

Coastal

Hazards mitigated

Flooding

Provided By



Number of people made more resilient

>35,000

The Johor Port Authority (JPA) leads an innovative community-focused model that integrates corporate social responsibility (CSR) with Islamic philanthropy. This approach encompasses environmental sustainability, education, economic empowerment and community engagement, impacting over 35,000 individuals in Johor through flood relief, climate action and inclusive growth within port communities.

ABOUT THE PROJECT

JPA faced the challenge of integrating sustainable development with community welfare in Malaysia's socio-culturally diverse landscape. The project, 'Growing Beyond Borders', addressed this challenge by pioneering a community-centred model that combines CSR mechanisms with Islamic philanthropic practices through the *Wakalah Zakat* framework.

Wakalah Zakat refers to the appointment of an authorised representative to distribute *zakat* funds on behalf of an official *zakat* authority. In this context, JPA serves as the appointed agent entrusted to responsibly channel *zakat* contributions to eligible recipients in accordance with Islamic principles.

JPA contributes approximately MYR 8 million (over \$1.9m) in *zakat* each year to the Johor Islamic Religious Council (MAIJ). Under the *wakalah zakat* arrangement, three-eighths (3/8) of the total *zakat* amount is returned to JPA. This enables JPA to directly distribute that portion of *zakat* to eligible recipients, ensuring assistance reaches those most in need effectively and promptly.

Between 2024-2025, JPA invested MYR 2.5 million (over \$590,000) to embed sustainability and societal engagement into port operations, aligning with Malaysia's national MADANI policy framework and the UN SDGs.

The MADANI Policy Framework represents Malaysia's national development philosophy, emphasising sustainability, innovation, respect, and compassion, designed to build an inclusive and progressive nation in line with international sustainability objectives.

The methodologies include targeted capacity-building programmes, community adoption with social welfare aid in terms of monetary help, food and educational donations, youth engagement in climate action and integrated *zakat* governance promoting ethical and equitable resource distribution.

Some of the major project elements included the Mangrove Care Programme to protect and conserve coastal biodiversity, technical apprenticeships to develop skilled local labour, and extensive flood relief measures, which helped over 2,000 local residents.

These flood relief efforts were carried out in close collaboration with government agencies and NGOs, providing food supplies, temporary shelters, and financial support, with special attention to women, children, and vulnerable groups.

Importantly, JPA also spearheaded large-scale waste cleanup operations in flood-hit neighbourhoods to restore sanitary conditions and reduce the emotional and physical stress on affected communities, particularly as the floods occurred close to the Eid festive season. This effort allowed families to recover and celebrate with dignity, reinforcing social cohesion and community resilience.

The programme also strengthened women's economic empowerment through the RATU (QUEEN) Entrepreneurship Initiative, which provides customised training, microgrant support, and mentorship. This initiative has enabled women in port communities to participate more actively in the local economy and achieve greater financial independence.

Furthermore, extensive stakeholder collaboration among public authorities, port operators, and civil society organisations facilitated efficient resource-sharing, alignment of local priorities, and active community participation. This synergy contributed to building a sustainable and inclusive port community ecosystem in Johor.

GEDSI elements were embedded across all project phases, from promoting women's income empowerment to supporting vulnerable groups through *zakat*-based aid such as food assistance for low-income households.

Efforts also focused on educational inclusion, providing opportunities for underprivileged students and ensuring equitable community participation in port-related development.

Upgrades included the provision of Smart TVs for digital learning, modernisation of computer laboratories, improvements to workshops and teachers' rooms, and the establishment of school fertigation projects to promote sustainable agriculture practices among students. Collectively, these efforts improved education standards, supported technical and vocational learning, and fostered environmental awareness, building long-term sustainability and resilience of local communities.

This comprehensive case study highlights JPA's innovative approach to embedding corporate and religious social responsibility within port governance. By leveraging strategic partnerships and community-focused frameworks, JPA has effectively addressed development challenges while advancing climate action, social resilience, and inclusive growth within Johor's port ecosystem.

ACHIEVED/INTENDED OUTCOMES

Social

Over 35,000 individuals have benefited from JPA's social, religious, educational, and disaster relief initiatives, including flood relief efforts that assisted more than 2,000 victims with essential supplies, waste cleanup operations, and temporary aid. These interventions eased community hardship, especially as the floods struck near the Eid festive season, helping affected families recover and celebrate with dignity.

Sponsorship programmes supported 430 underprivileged students across 80 schools with uniforms and school supplies, while tuition sponsorships for 2,000 students enabled 1,400 to improve their exam performance. The RATU (QUEEN) Entrepreneurship Programme empowered 30 women and low-income participants, and *zakat* funds were used to build two new homes for underprivileged families.

Environmental

Environmental initiatives include a target to plant 160,000 mangrove trees by 2027, strengthening coastal protection, biodiversity, and climate resilience. In 2023–2024, 25,000 mangrove trees were planted with active participation from staff and students, supported by collaborative mangrove care programmes focused on environmental restoration. Flood disaster relief efforts also contributed to environmental cleanup, and a rescue boat was donated to enhance the capacity of first responders during emergencies.

Economic

A programme costing MYR 25,752.00 (\$6,110) provided upgraded licensing for 14 port lorry drivers, enhancing logistics efficiency and job readiness. Meanwhile, economic empowerment initiatives for women worth MYR 40,000.00 (\$9,490) supported local socio-economic growth through entrepreneurship and food skills training. Additionally, the completion of 50 community infrastructure projects, including homes for underprivileged families and the repair of damaged school roofs, has further strengthened community development and local economic participation.



Mangrove forest (©Toni Wöhrli)

IMPROVED DISASTER RISK MANAGEMENT FOR PORTS IN THE CARIBBEAN

Sector

 Seaports

GEDSI Elements

GENDER EQUALITY

SOCIAL INCLUSION

Highlights

Accessibility

Capacity building

Carbon mitigation

Disaster management

Green infrastructure

Livelihood protection

Project team

Secretariat of the Inter-American Committee on Ports (CIP) of the Organization of American States (OAS)

Project start/completion date

2021 - 2024

Location

Caribbean

Communities impacted

Coastal

Hazards mitigated

Flooding, Cyclones

Provided By



Number of people made more resilient

>182

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The Improved Disaster Risk Management (DRM) for Ports in the Caribbean project strengthens the region's capacity to prepare for and respond to climate-related and industrial hazards. It promotes inclusive, sustainable, and equitable resilience across Caribbean ports, safeguarding lives, livelihoods, and infrastructure.

ABOUT THE PROJECT

The Improved DRM for Ports in the Caribbean project, led by the Secretariat of the Inter-American Committee on Ports (CIP) of the Organization of American States (OAS), funded by the Governments of Italy and the United States, with institutional support from the Caribbean Disaster Emergency Management Agency (CDEMA), Caribbean Shipping Association (CSA), HudsonAnalytix, Port Management Association of the Caribbean (PMAC), T&T Salvage, and the United States Coast Guard (USCG), represents an important effort to enhance disaster preparedness across one of the world's most climate-vulnerable regions. While its core aim is to strengthen the ability of Port and Maritime Authorities to manage and mitigate disaster risks, the project fosters an integrated approach to equity, inclusion, and sustainability.

Caribbean ports are economic lifelines, facilitating trade, enabling access to essential goods, and serving as key nodes for disaster response. But their exposure to climate threats such as hurricanes, sea-level rise, and industrial accidents poses major risks to national stability and local livelihoods. The hardest hit are often vulnerable populations: low-income families in coastal areas, informal port workers, and women disproportionately impacted by economic disruptions.

This project tackles these risks directly by providing Port and Maritime Authorities with advanced DRM strategies, tools, and frameworks, including a Model Emergency Operations Plan (MEOP) readily available in English, Spanish, French, and Portuguese, as well as a DRM recommendations report for decision makers.

It goes further by embedding inclusivity into its core, empowering communities to shape solutions through participatory engagement and planning. Training and table-top exercises are tailored not only to institutional needs but also to those of frontline populations.

A total of 182 port and DRM officials from 14 Caribbean Nations were trained in capacity-building sessions held in Jamaica, Barbados, and Trinidad and Tobago. Through tabletop exercises with a special emphasis on resiliency planning and Marine Transportation System Recovery (MTSR), they addressed hurricanes, tropical storms, oil spills, and even labour unrest. The training also included site visits to Kingston Wharves Limited in Jamaica, Barbados Port Inc., and the Port of Spain, including its command centres, to observe operations and identify how disruptions might affect port logistics, as well as better understand the practical response capabilities within the port.

An additional focus is gender equality. The project

recognises that women often face unique socio-economic barriers in DRM, which can include limited access to information and/or resources, the disproportionate burden of caregiving, and underrepresentation in decision-making. In response, it ensures that women are not only consulted but actively trained and positioned in leadership roles within emergency management systems. This empowers women as responders, decision-makers, and resilience champions, enhancing overall disaster response capacity. The project also acknowledged the specific needs of other marginalised groups, including youth, persons with disabilities, and others. Many of these groups lack access to EWS or inclusion in decision-making. In response, the project promotes inclusive communication strategies, such as multilingual alerts and accessible educational materials, to align with the Sendai Framework's call for 'all-of-society' engagement.

The project is highly tailored to the local context.



Recognising the Caribbean's geographic and political diversity, it promotes regional collaboration while supporting locally adapted interventions. Through peer exchanges, technical workshops, and cooperative platforms, Caribbean nations can share best practices and co-develop scalable, culturally relevant solutions. This collective learning approach strengthens the region's ability to withstand future shocks.

Incorporating the principles of the UN Global Compact, the initiative aligns with global standards on gender, human rights, labour, and environment. It supports multiple SDGs, particularly SDG 9 (Infrastructure), SDG 13 (Climate Action), SDG 5 (Gender Equality) and SDG 10 (Reducing Inequalities), and is further guided by the UN Sendai Framework for Disaster Risk Reduction, which calls for inclusive, people-centred risk management. Additionally, the project reflects the rights-based obligations outlined in the Inter-American Commission on Human Rights' (IACHR) Resolution 3/21, recognising the disproportionate impact of climate change on vulnerable groups and the duty of states to protect those most at risk.

Ultimately, this initiative aims to bolster what it means to manage disaster risk in the Caribbean context. It moves beyond infrastructure alone to invest in people, institutions, and inclusive planning processes.

Ports are not just logistical hubs; they are social and economic anchors. By embedding the values of gender equality, equity, inclusion, and sustainability into every aspect of port resilience planning, and aligning with global frameworks like the UN Global Compact, the Sendai Framework, and the IACHR, the project supports a more secure, just, and climate-resilient future for all Caribbean communities.

In April 2025, the CIP Secretariat began the design of Phase Two of the project to continue targeted capacity building and the development of a coordinated regional response framework to enhance disaster preparedness and resilience across Caribbean ports.

ACHIEVED OUTCOMES

Social

The project aims to strengthen the social component of disaster response and resilience by embedding accessibility, gender equality, equity, inclusion, and human rights into the core of preparedness efforts. The training materials developed and disseminated through the project explicitly addressed the unique risks faced by these groups, integrating equity and inclusion into every aspect of DRM. These materials were designed not only to build technical capacity but also to raise awareness among port and DRM officials about the importance of inclusive preparedness and response. This people-centred approach contributes to more cohesive, informed, and resilient communities, capable of managing disasters more equitably.

Environmental

Sustainability is a cross-cutting priority. The project encourages ports to integrate long-term climate resilience into their DRM strategies by investing in green infrastructure, renewable energy, and environmental and social impact assessments. These practices not only reduce emissions and ecological damage but also foster healthier, more resilient communities. By tying disaster preparedness to sustainable development, the project contributes to intergenerational equity and environmental justice. Importantly, a champion of the project was Barbados Port Inc., hosting one of the table-top exercises addressing oil spills and other environmentally destructive disasters, bolstering its vision 'to be the most innovative, green maritime hub in the world by 2030'.

Economic

By reinforcing port infrastructure, stakeholder coordination, and business continuity planning, the initiative protects thousands of jobs across the region tied to port operations. Ensuring that supply chains remain operational during crises safeguards not only trade but also food security, healthcare access, tourism and small business survival for the over 44.5 million people who call the Caribbean their home.

SHOWCASING INCLUSIVE, SUSTAINABLE AND CLIMATE-RESILIENT DEVELOPMENT IN AIVP MEMBER PORTS



The AIVP (International Association of Ports and Cities) network brings together urban and port stakeholders and their partners around the world. With over 130 members, AIVP aims to integrate sustainability and climate resilience into port operations, ensuring that economic growth goes hand-in-hand with environmental and social upliftment. The case studies below highlight examples of this work from across AIVP's member organisations.



Palma's Nou Passeig Marítim: Citizen Voices, Climate Resilience & Waterfront Renewal

AIVP Member Port
CASE STUDY 1

Sector

 Seaports

GEDSI Elements

SOCIAL INCLUSION

Highlights

Coastal resilience

Community engagement

Community wellbeing

Mobility

Project owners

Port Authority of the Balearic Islands (APB),
City of Palma (Spain)

Project start/completion date

November 2022 - ongoing

Location

Balearic Islands, Spain

Hazards mitigated

Flooding, Heatwaves

Provided By



Ports de Balears

Autoritat Portuària de Balears

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Palma's Nou Passeig Marítim stands as an interesting case of citizen-driven waterfront renewal. Spearheaded by the Port Authority of the Balearic Islands (APB) in alliance with the City of Palma (Spain), the project responds to public aspirations to reconnect the city and the sea, reorient mobility, and embed climate resilience against rising temperatures and floods into the urban edge via a 3.5km long urban renewal space.

From the earliest stages, the Nou Passeig Marítim has emphasised listening to citizens rather than imposing top-down designs. While the technical work built the legal and engineering framework, community consultation shaped the real form and priorities. In more than 60 public meetings, neighbourhood associations, mobility groups, cultural actors, environmental NGOs, and businesses contributed detailed input on the scale of green space, alignment of crossings, distribution of public amenities, and the balance of pedestrian/cyclist vs vehicular space. Some participatory actions were also organised, such as student visits, tree-planting activities with residents, sports competitions on site, and more.

This inclusive process turned the promenade into a co-designed infrastructure, rather than a retrofitting exercise. Citizens insisted on frequent crossings (one every ~100m), broad sidewalks, shaded pathways, play areas, benches, and safer accessibility to adjacent neighbourhoods.

The Nou Passeig Marítim is positioned as a tool against climate change by integrating mitigation and adaptation measures from the outset. Acting on mobility, the promenade gives priority to non-motorised transport and public transit, reducing reliance on private vehicles – a direct lever to cut emissions thanks to a 70% increase of the road space share for pedestrians, bikes and green spaces.

Regarding urban heat, the new promenade will include more than 1,820 new trees across 21 species, and 37,000 m² of planted zones contribute to reducing the heat-island effect and sequestering CO₂. Sustainable drainage & water reuse is also part of the project with a drainage system that filters pollutants, reuses

rainwater, and reduces flood risk in zones vulnerable to runoff. Energy consumption was integrated in the plan through LED lighting with control systems and distributed EV charging points to support low-carbon operations. Through these measures, the promenade becomes both a public realm upgrade and living climate infrastructure: cooling, filtering pollutants, and reducing emissions. The total investment is more than €53m and should be completed in 2028.

The Nou Passeig Marítim does not stand in isolation. In late 2024, the APB's board unanimously initiated a reconfiguration of the Port of Palma. The port reorganisation aligns with the citizen-centric waterfront in several ways. The cruise operations will be focused on a specific location to localise impact and free other edges for public use. The ship repair industry will be relocated to vacate the central port fronts.

Those reclaimed zones will be used for cultural, educational and recreational uses, and complement the promenade to create a coherent interface between port and city. The port reorganisation also pursues sustainability by electrifying docks (with the ambition to fully electrify by 2030) and embedding eco-standards in port operations.

The Nou Passeig Marítim is emerging not merely as a refurbished seafront, but as climate-resilient, socially inclusive, and citizen-shaped infrastructure. It converted public demand for greener mobility and access into tangible design. Coupled with a synchronised port reorganisation, Palma is developing a holistic, adaptive waterfront – one that brings city, community, and climate into a cohesive future.

© Port Authority of the Balearic Islands



Reconnecting the underserved Wilmington community to the water's edge

AIVP Member Port
CASE STUDY 2

Sector

 Seaports

GEDSI Elements

SOCIAL INCLUSION

Highlights

Accessibility

Biodiversity

Community engagement

Green infrastructure

Project owner

Port of Los Angeles

Project start/completion date

November 2020 - February 2024

Location

Los Angeles, USA

Hazards mitigated

Heatwaves

Provided By



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Located in the heart of the Port of Los Angeles, the Wilmington Waterfront Promenade project is part of a co-shared and long-term development strategy to provide waterfront access, improve the quality of life, and develop new economic opportunities for the adjacent Wilmington community, classified in the US as an 'environmental justice' community. This means that the population are mainly BIPOC (Black, Indigenous and People of Color) and that they suffer from exacerbated pollution, notably for living so close to a port that used to be source of heavy air, water and noise pollution. For the first time since the port's creation, it offers a physical connection between the Wilmington district and the waterfront, creating an impressive setting showcasing the port activities while improving the quality of life for residents.

Completed in 2024, the project is strongly grounded in the Wilmington Harbor City Community Plan, a decision-making guide that represents the land use vision and values for the district. It includes:

- A 1,300-foot (396-meter) promenade
- 5,400-sqft (501-sqm) public pier
- 10,000-sqft (929-sqm) play area
- Green spaces for recreation and live entertainment
- Future space for commercial development and an aquatic centre.

The Port took an active approach throughout every phase of the project to engage the public in its design, not only making recommendations but also approving financial policies. Community engagement was present in the planning, design and construction phases. It included the notification of over 600 entities, provided Spanish interpreters at the 15 public outreach meetings, and distributed over 70,000 postcards and 2,000 flyers. This collaborative approach paved the way for the Port to address ideas and concerns that impacted the final design, such as the type of amenities and preservation of historical features. It was specifically designed with accessibility in mind, by following and going beyond ADA standards. It was also conceived for people with children with large shaded playgrounds.

This ultimately contributed to maximising the promenade's use.

To support local biodiversity, landscaping was realised with native plants, and sustainable stormwater management was implemented to increase the resilience of the facilities with multiple bioswales and water-receiving planters. The project conception also integrated the goal to reduce urban heat, by incorporating green infrastructure and specific design elements like numerous shading areas and many seating possibilities.

The Wilmington Waterfront Promenade project is also an impressive outcome of the Port Authority's Public Access Investment Plan, which allocates 10% of the Port's annual income to investment in public facilities like new public space and access to the waterfront, but also sports and culture facilities. It also demonstrates a coherent vision for the port and city where one need not dominate and exclude the other.

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Duwamish River People's Park and shoreline habitat: An ecological restoration project to strengthen the port-city relationship

AIVP Member Port
CASE STUDY 3

Sector

 Seaports

GEDSI Elements

SOCIAL INCLUSION

Highlights

Biodiversity

Community engagement

Community wellbeing

Ecological uplift

Project owner

Port of Seattle

Project start/completion date

2020-2022

Location

Seattle, USA

Hazards mitigated

Flooding

Provided By



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The Duwamish River People's Park and Shoreline Habitat (DRPP) is the largest restoration project on Seattle's only river, transforming a significantly polluted 14-acre site into a vibrant park and habitat area in an 'environmental justice' neighbourhood, meaning a socially and environmentally vulnerable population, largely made up of communities of colour and low-income communities. Completed in 2022, this project was implemented in a specific territorial and cultural context. Gradually urbanised to meet the needs of port and industrial development, the banks of the Duwamish River have historically been a fishing and leisure area with a strong tribal heritage. Aware of this dual identity, the Port of Seattle has defined a global development strategy that prioritises environmental sustainability alongside economic growth. It includes a close coordination and partnership between the Port, Boeing, the City of Seattle, King County, the residents of the Duwamish Valley, and the Indigenous nations to ensure that diverse perspectives informed the project's goals: environmental cleanup, habitat restoration, and community reconnection with the river.

It also prioritises resident input by recognising the historical disconnect between the industrial riverfront and the community. Therefore, the Port established a local field office to gather feedback and design ideas directly from those most impacted by decades of pollution. This ensured the park addressed the community's needs for green space, river access, and a healthy environment. The field office has now been converted to a community hub.

Since it opened, the site has become a refuge habitat for endangered Chinook salmon. It also provides new access to the river for the whole community, particularly the South Park district residents. The park includes trails, a lookout point, and a boat launch. Importantly, the increase in the salmon population, encouraged by the ecological restoration of the site and more than 85 ha of freshwater, estuarine, and marine habitats, has created favourable conditions for tribal fishing.

The project also established a first-of-its-kind 'habitat credit bank' for the Port. This allows third parties to invest in restoration efforts through habitat mitigation credits, generating revenue for further ecological improvements. This innovative model promotes broader environmental responsibility while fostering financial sustainability for future projects.



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2.2

KNOWLEDGE FOR ACTION AND CAPACITY BUILDING

Through knowledge-sharing and capacity-building, we can accelerate the adoption of tools, resources and skills that advance sustainable and resilient infrastructure in communities worldwide. Open-source tools and resources, training programmes, and knowledge transfer initiatives can empower both local communities and professional networks to develop inclusive, climate-resilient infrastructure solutions. The examples below illustrate how such tools, resources and knowledge-sharing efforts can support practitioners and communities in integrating GEDSI into sustainable, resilient infrastructure planning and implementation.

DELIVERING INCLUSIVE DESIGN IN CITIES: A GLOBAL ACTION REPORT

The Global Action Report, developed by the Global Disability Innovation (GDI) Hub, aims to equip cities with practical but evidence-based actions to accelerate accessibility and inclusion in their physical infrastructure, buildings, services, and operations. The report was prepared as part of GDI Hub's mission to ensure that assistive technology (AT) users, including people with disabilities, can access, participate, and enjoy urban life on an equal basis with all citizens, funded by UK International Development under the AT2030 programme. Acknowledging cities' pivotal role in climate action, the report also highlights that urban adaptation and mitigation efforts must integrate accessibility and inclusion from the outset.

Cities worldwide are experiencing continued growth but have limited resources, particularly in low- and middle-income settings, where large-scale infrastructural development is often necessary. With local resource constraints and growing global challenges, including rising inequality, climate change, and pandemics, it is even more critical that accessibility and inclusive design are seamlessly integrated into the planning and design of cities and all their functions. This will enable effective use of resources, create liveable cities, and ensure people with disabilities are not left behind.

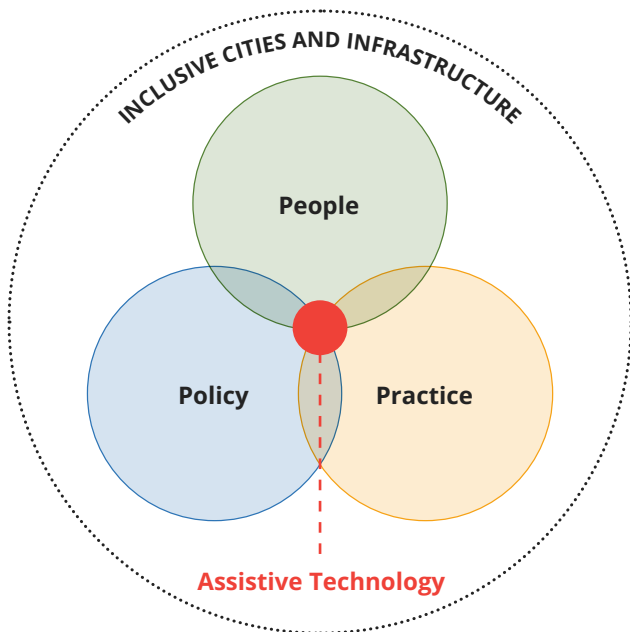
National governments generally set disability policy, while cities require locally adaptable and practical frameworks to implement inclusive action. This suggests the need for a global agenda of inclusive urban practices to catalyse shared learning and collective efforts for co-creating inclusive cities. An inclusive city is a place where the built environment, infrastructure and services are planned and designed to accommodate and empower everyone who lives there. Grounded in inclusive design and shaped by lived experiences, it promotes equality, accessibility, and diversity, creating environments that reduce or remove barriers, dismantle stigma, foster independence, and enrich life for all residents.

The report sets out 10 principles for inclusive cities and details 16 action areas that guide transformative change across sectors, primarily targeting city, local, and regional governments to accelerate inclusion



through design. It is designed as an evidence-based tool for capacity building, guiding rapid assessment and development of bespoke action plans, and evaluating impact and legacy through pilot projects. It highlights the need to maintain access to assistive technology during disasters and transitions, while ensuring that low-carbon construction methods and locally produced solutions remain accessible throughout – from procurement to use. The underlying research which informs the report can be found in the accompanying Comparison Report on Inclusive Infrastructure and Cities.

The Climate Adaptation and Mitigation action area sets clear expectations: city climate action plans should actively involve people with disabilities, apply accessibility standards across all climate adaptation and mitigation infrastructure, and ensure that DRM and emergency response systems are inclusive and responsive to the diverse needs of people with various impairments. Implementing these actions requires collaboration among a range of stakeholders, including urban practitioners, organisations of persons with disabilities (OPDs), and development sector professionals. Cities are encouraged to create an inclusive city stakeholder map using the People, Policy, and Practice framework, tailored to their local context and culture.



Delivering inclusive infrastructure:

People – the community experience of disability and the built environment.

Practice – industry focused research with urban and built environment stakeholders on the awareness and application of inclusive design and successful delivery in practice.

Policy – research with local government stakeholders on the governance, strategy, guidelines and protocols of accessibility and inclusive design at local, regional and national levels of government.

Above: The framework illustrates the relationship between People, Policy, and Practice as key dimensions in delivering inclusive cities and infrastructure. At their intersection lies Assistive Technology, representing the enabling connection between community experience, governance, and professional practice to support inclusive design and accessible environments. Source: Delivering Inclusive Design in Cities: A Global Action Report

Below: Tactile mapping as part of co-design workshops in Indonesia.
© Global Disability Innovation Hub and Kota Kita



DISASTER RESILIENCE SCORECARD FOR CITIES

In December 2022, UNDRR launched the *Disaster Resilience Scorecard for Cities - Annex for the Inclusion of Persons with Disabilities* (The Disability Inclusion Scorecard) under the *Making Cities Resilient 2030* initiative to support local governments in advancing disability-inclusive DRR. The Disability Inclusion Scorecard is a self-assessment tool that enables local governments, through a participatory multi-stakeholder process, to evaluate progress, identify gaps, and prioritise actions for disability-inclusive DRR in line with the Sendai Framework, the *UN Disability Inclusion Strategy*, and the *Ten Essentials for Making Cities Resilient*.

In 2023, 21 cities across 10 countries (Bhutan, Brazil, Chile, Colombia, Costa Rica, El Salvador, Kazakhstan, the Philippines, Uganda and Uruguay) implemented the Disability Inclusion Scorecard with UNDRR's technical support. Cities used the Scorecard to identify gaps in accessibility and participation of persons with disabilities in emergency preparedness and response activities.



This led to the establishment of new coordination mechanisms with local OPDs, accessibility audits of public infrastructure, and the integration of inclusive measures into local disaster management plans in one of the Philippines' cities. It also led to the development and delivery of inclusive DRR training for persons with disabilities and their representatives, the provision of social and psychological support, and the integration of accessible transportation and infrastructure in one of the Bhutanese cities.

Pilot of Disability Inclusion Scorecard, Kazakhstan.
© UNDRR



Additionally, the pilot in Kazakhstan raised awareness about the importance of understanding the differentiated needs of persons with disabilities, and led to the development and adoption of the National Concept on Inclusive Policy 2025-2030.

The pilot revealed that while cities showed progress in some areas, overall advancement toward comprehensive disability inclusion remains limited. Four overarching challenges persist:

- The absence of disaggregated data on persons with disabilities;
- Limited knowledge of DRR and persons with disabilities among policymakers, along with a lack of DRR knowledge among persons with disabilities and OPDs;
- Lack of participation from persons with disabilities and OPDs in DRR processes;
- Absence of designated focal points for disability inclusion within local government departments.

These gaps hinder effective planning, coordination, and resource allocation. To strengthen disability inclusion in DRR, cities are recommended to:

- Make inclusion of persons with disabilities a core policy objective, integrating their rights into plans and strategies.
- Establish comprehensive systems to collect and use disaggregated disability data.
- Conduct awareness and capacity-building programmes involving all key stakeholders.
- Ensure active participation of persons with disabilities and OPDs in all DRR phases.
- Designate empowered focal points with expertise in disability inclusion.
- Allocate specific budgets for inclusive measures and enforce universal design standards.
- Engage OPDs in contingency planning, inclusive communication, and post-disaster recovery.

Implementing these recommendations will promote more inclusive, resilient urban environments. The Disability Inclusion Scorecard emerges as a valuable tool for identifying gaps, guiding local action, and strengthening the integration of disability inclusion into DRR worldwide.

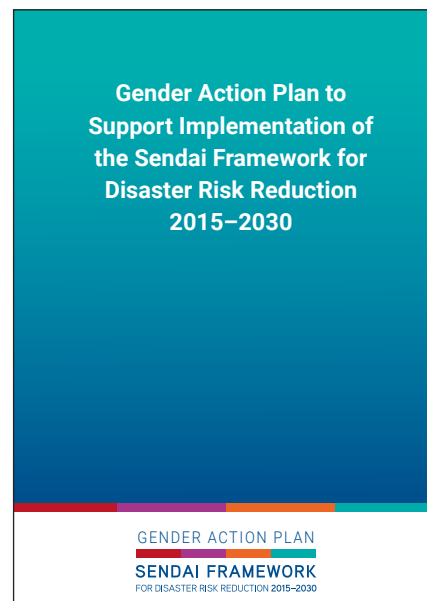
GENDER ACTION PLAN TO SUPPORT IMPLEMENTATION OF THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION

The Gender Action Plan to Support Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 (Sendai GAP) aims to advance gender-responsive and disability-inclusive DRR and resilience by 2030. Grounded in the guiding principles of the [Sendai Framework](#), the plan emphasises that effective DRR must integrate gender equality, disability inclusion, and human rights, including the right to development through inclusive and equitable participation of all members of society. The Sendai GAP recognises that the leadership, empowerment, and meaningful participation of women, persons with disabilities and other groups at risk are central to building resilient communities and achieving sustainable development.

It serves as an enabling policy framework that supports governments and partners in integrating gender equality, disability and social inclusion into national and local DRR policies and strategies. Adopted in 2024, the Sendai GAP serves to guide implementation and catalyse action by translating gender-responsive and disability-inclusive approaches into concrete entry points and examples at national and local levels. Policy- and decision-makers can use the Sendai GAP as a practical tool to advance more effective and inclusive climate and disaster resilience.

The Sendai GAP responds to evidence that gender inequality exacerbates disaster risks and impacts, particularly for women, girls, persons with disabilities and other marginalised groups. It recognises that intersectional factors, such as poverty, disability, displacement, and geographic isolation, compound vulnerabilities and therefore require targeted, inclusive, and gender-responsive risk management strategies.

The plan operationalises these principles by aligning DRR with international commitments such as the [2030 Agenda for Sustainable Development](#), especially SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 10 (Reduced Inequalities), and SDG 13 (Climate Action), the [Convention on the Elimination of All Forms of](#)



[Discrimination Against Women](#), and the [Convention on the Rights of Persons with Disabilities](#), among others.

The Sendai GAP was developed through an extensive multi-stakeholder consultation process, led by UNDRR, engaging Member States, national women's machineries, OPDs, civil society, academia, the private sector, and international partners. It underscores the importance of an all-of-society and whole-of-government approach to DRR. While national governments hold primary responsibility for implementing the Sendai Framework, its success depends on collaboration and shared accountability across all levels and sectors. National women's machineries are recognised as critical actors in coordinating gender equality and social inclusion measures, promoting policy coherence, and ensuring that DRR strategies are both gender-responsive and disability-inclusive.



The overarching goal of the Sendai GAP is to accelerate the achievement of the Sendai Framework's targets by substantially increasing resources, actions, and measurable impacts of gender-responsive and disability-inclusive DRR while reducing gender-related and intersectional disaster risks by 2030. Grounded in the Sendai Framework's four priorities, the Sendai GAP set out key objectives that advance equality, empowerment, and inclusive resilience for all:

- 1. Understanding disaster risk:** Strengthening the collection and use of sex-, age-, income-, and disability-disaggregated data, and applying gender and intersectional analysis to inform risk assessment and decision-making.
- 2. Strengthening disaster governance:** Mainstreaming gender equality and disability inclusion in DRR laws, policies, and institutions, and ensuring women's and persons with disabilities' participation and leadership in decision-making.
- 3. Investing in resilience:** Integrating gender equality and inclusion into DRR financing and investments, and expanding access to funding for women's and community-based organisations.
- 4. Enhancing preparedness, response and recovery:** Implementing gender-responsive and disability-inclusive EWS, ensuring equitable recovery and 'building back better', and enhancing access to essential services, including sexual and reproductive health and protection from GBV.

GENDER EQUITABLE AND INCLUSIVE CLIMATE ACTION PLANNING: TOOLKIT FOR CITIES AND LOCAL GOVERNMENTS



Climate change impacts exacerbate existing inequalities. Women, girls, and marginalised communities are disproportionately affected by climate impacts, yet they are also powerful agents of change. Cities, as the level of government closest to people, are uniquely positioned to lead inclusive and transformative climate action.

Developed by the Global Covenant of Mayors for Climate & Energy (GCoM), this toolkit is a practical guide to help cities and local governments embed gender equity and inclusion into climate action planning. It addresses the urgent need for strategies that cut emissions while tackling systemic inequalities that increase climate risks for marginalised groups, especially women and girls. Importantly, the toolkit recognises that not all actions will be immediately transformative. Change often begins with small, intentional steps. For example, in Cuenca, Ecuador, participatory budgeting has empowered communities to decide how local climate adaptation funds are spent, resulting in nearly 700 projects, 89% of which focused on flood protection, drainage, and green space improvements; 60% of the participants were women. These kinds of inclusive, community-led initiatives demonstrate how small-scale actions can, over time, build the foundation for long-term, systemic transformation. The guidance is designed to be flexible and scalable, supporting cities at any point in their climate journey.

Integrating gender and inclusion into climate action is essential to address the disproportionate risks faced by marginalised communities. Gender inequality remains one of the most persistent and widespread

forms of exclusion, intersecting with other social barriers to deepen vulnerability. Prioritising inclusive approaches strengthens climate strategies, making them more effective and equitable. This leads to resilient cities that support all residents fairly and sustainably. For instance, Durban, South Africa, has combined health and socio-economic data with climate risk mapping to identify where women, elderly people, and informal settlement residents face the greatest health risks from floods and heatwaves, guiding targeted interventions that build resilience.

Cities and local governments are on the frontlines of both climate impacts and innovation. They concentrate risk, but also opportunity. With the right tools, cities can translate global climate goals into locally grounded, inclusive action that benefits all residents. As hubs of governance and creativity, they hold the power to shape equitable futures at scale.

The toolkit highlights the importance of centring equity and inclusion in climate strategies. To support this, the toolkit is grounded in three core principles:

- **Do no harm** - Programmes that address basic needs and vulnerabilities of women and marginalised groups.
- **Empowerment** - Programmes that build assets, capabilities, and opportunities for women and marginalised groups.
- **Transformative change** - Programmes that address unequal power relationships and seek legal, institutional, and societal change.

The toolkit is structured in two parts. Part One explores the context and explains why inclusive approaches are essential in the face of intersecting climate and social challenges. Part Two sets out a nine-step approach for embedding gender and inclusion into climate action planning: making commitments, mapping power gaps, empowering communities, translating stories into actions, developing inclusive plans, adopting equitable finance and procurement, implementing inclusive climate actions, and embedding monitoring, evaluation, accountability, and learning to track progress and adapt over time.

**Location**

Global South

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HANDBOOK FOR GENDER-INCLUSIVE URBAN PLANNING AND DESIGN

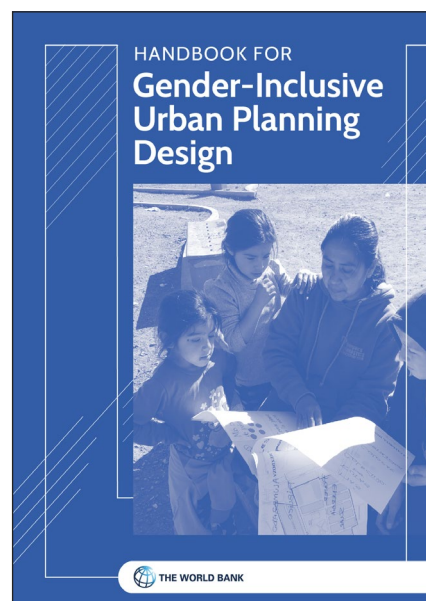
Developed by the World Bank and co-authored with Kounkuey Design Initiative (KDI), the *Handbook for Gender-Inclusive Urban Planning and Design* provides a comprehensive framework for understanding and addressing how the built environment both reflects and reinforces gender inequities. It bridges the gap between policy and practice by combining conceptual foundations with practical guidance to help create cities that work for everyone.

The handbook examines six interrelated issue areas – Access, Mobility, Safety and Freedom from Violence, Health and Hygiene, Climate Resilience, and Security of Tenure – to illustrate how conditions in the urban environment interact with, and often intensify, gender-based disparities. Together, these themes provide a lens for identifying barriers and opportunities to advance gender equity through more inclusive planning and design.

The handbook presents practical approaches, activities, and design guidelines that demonstrate how to implement a participatory and inclusive design process exploring the experiences and uses of the city from the perspective of all citizens: women, men, and sexual and gender minorities. It provides clear, specific design guidelines, appropriate for and adaptable to all regions, across planning fields including housing, public transport and mobility infrastructure, other infrastructure services, and city master plans.

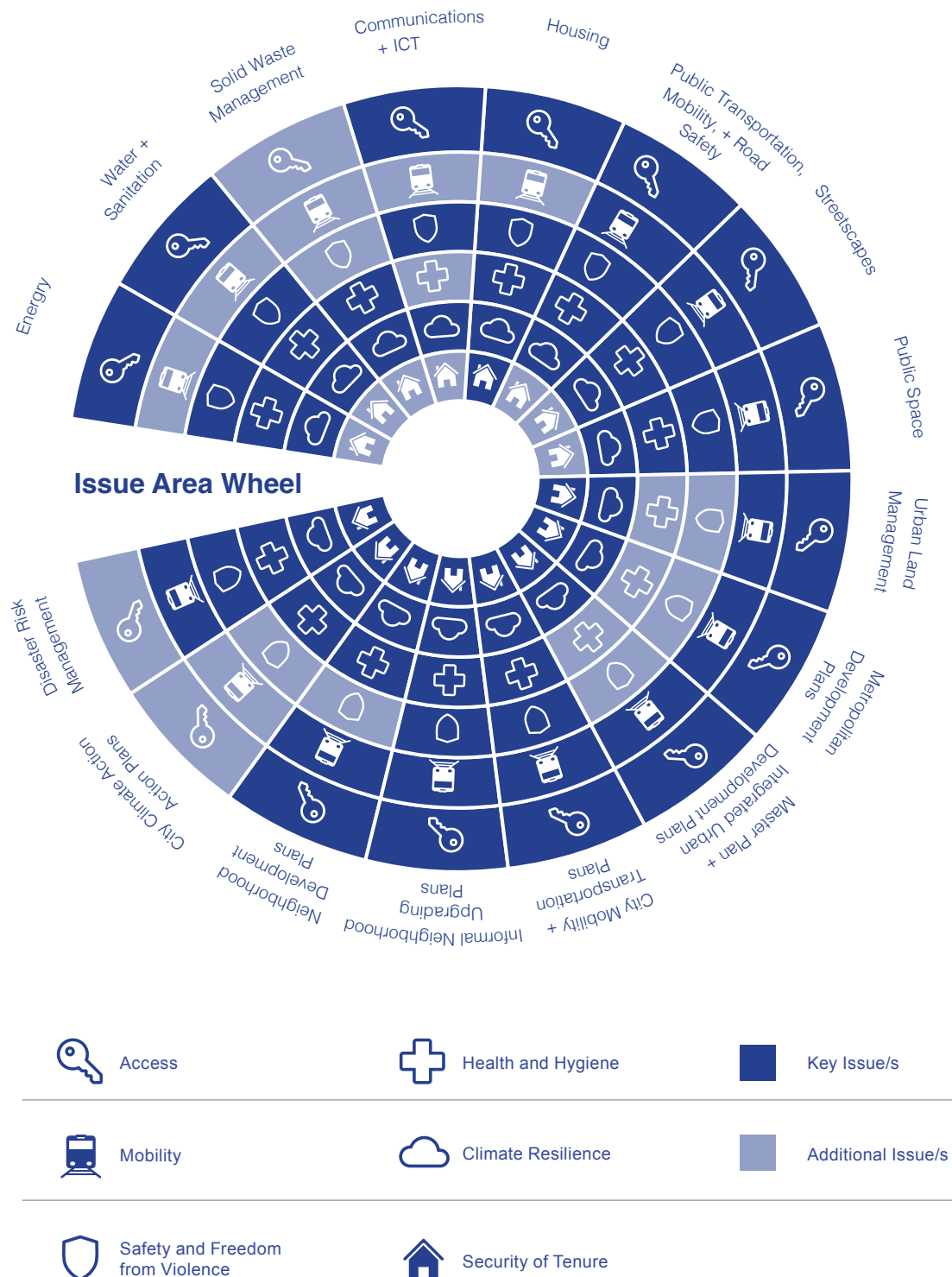
A dedicated chapter on Process, Plan, and Project Guidelines translates principles of gender equity into adaptable actions for practitioners. These guidelines establish key commitments to participation, integration, universal design, and accountability, offering concrete recommendations for urban planning and project typologies ranging from city master plans and mobility frameworks to housing, DRM, and basic urban services.

Global case studies of successful gender-inclusive projects demonstrate how simple design measures can dramatically increase agency and wellbeing for disadvantaged groups and gender minorities. These examples illustrate how increasing visibility and participation for disadvantaged groups



promotes safety and access to the public realm, how proper planning with a gender lens ensures full participation of underrepresented voices, how better representation yields innovative designs that serve everyone better, and how short-term measures can complement and enable long-term strategic efforts to improve gender equity. Supported by these practical examples, the handbook offers strategic direction and tools to foster more inclusive, equitable, and sustainable urban environments.

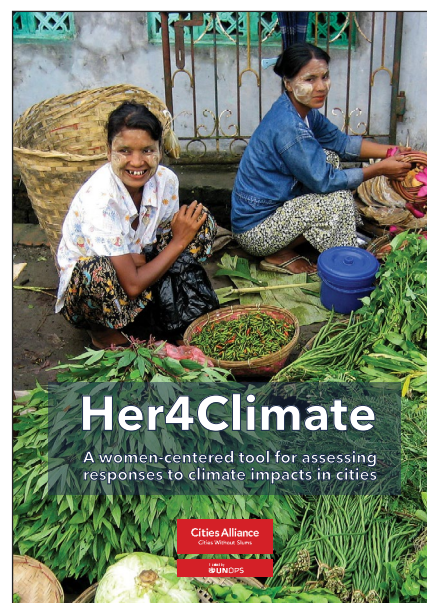
Planning and Project Guidelines



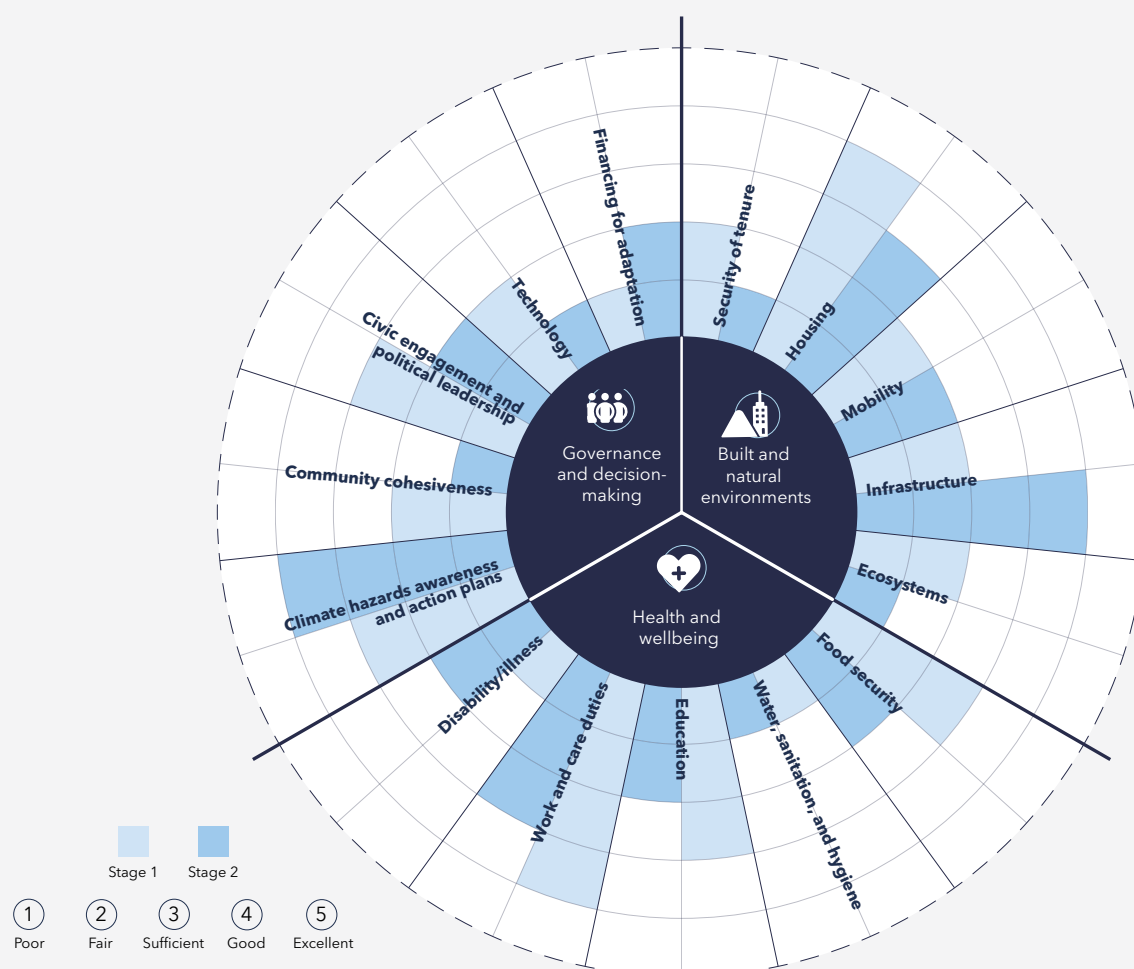
Source: Handbook for Gender-Inclusive Urban Planning and Design

HER4CLIMATE: GENDER MAINSTREAMING IN CLIMATE ADAPTATION PLANS

Her4Climate is a participatory assessment tool developed by Cities Alliance in collaboration with Arup to mainstream gender considerations in climate adaptation. Cities Alliance operates at the intersection of gender mainstreaming, urban planning, and urban resilience, recognising their interconnected roles in building sustainable communities. It explores how these dimensions converge to address climate change and advance inclusive urban development. Building on this integrated approach, the Her4Climate tool equips practitioners, government officials, and urban professionals to strengthen climate action by centring the knowledge, experiences, and leadership of women in cities.



The Her4Climate tool uses scores ranging between 1 (inner circle) and 5 (outer circle) to indicate how well a city/community performs against each factor, where 1 indicates 'poor performance' and 5 indicates 'excellent performance'. Source: Her4Climate



The Her4Climate tool promotes women's participation, leadership, and agency in designing and managing climate adaptation initiatives. It identifies the factors shaping women's exposure, sensitivity, and adaptive capacity to climate impacts and examines both short- and long-term effects through three interrelated dimensions essential to a gender-transformative city response:

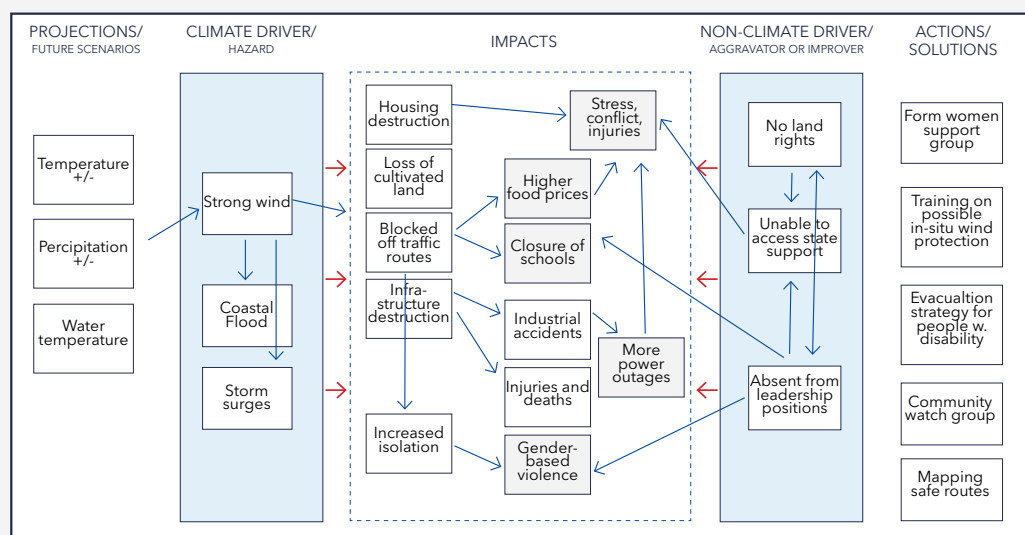
- 1. Health and Wellbeing**, covering food security, WASH, education, work and care duties, and disability or illness;
- 2. Built and Natural Environments**, including land tenure, housing, mobility, infrastructure, and ecosystems; and
- 3. Governance and Decision-making**, covering climate awareness and action plans, community cohesion, civic and political leadership, technology, and financing for adaptation.

Together, these dimensions provide a holistic framework for identifying gendered vulnerabilities and strengthening women's role as agents of change.

A key application of the tool is in a participatory workshop with all interested parties. The diagram below shows a typical output from the workshop

that maps how climate hazards like strong winds, coastal floods, and storm surges, driven by changing temperature, precipitation, and water levels, lead to impacts such as housing loss, food insecurity, and gender-based violence. These are worsened by limited land rights, weak state support, and low female representation, while women-led actions such as support groups, training, evacuation plans, and safe-route mapping help build resilience.

In 2023, Cities Alliance and UNOPS adapted the Her4Climate tool for use in Nepal under the [Cities for Women Project](#). The tool was applied in ten cities through participatory workshops, focus group discussions with women and community representatives, interviews with local administrators and city leaders, and spatial mapping exercises. This process enabled stakeholders to identify how climate hazards, such as floods, landslides, and heat stress, affect women differently and to pinpoint local priorities for gender-responsive adaptation. The findings informed the selection of six cities for targeted project implementation, where Her4Climate can support the design of inclusive climate actions that strengthen women's resilience, participation, and leadership in urban climate planning and decision-making.



Example output of workshop on mapping climate change impacts and actions.
Source: Her4Climate

CLIMATE RESILIENT SANITATION ASSET CREATION AND RETROFITTING PROTOCOL FOR RURAL SANITATION IN INDIA

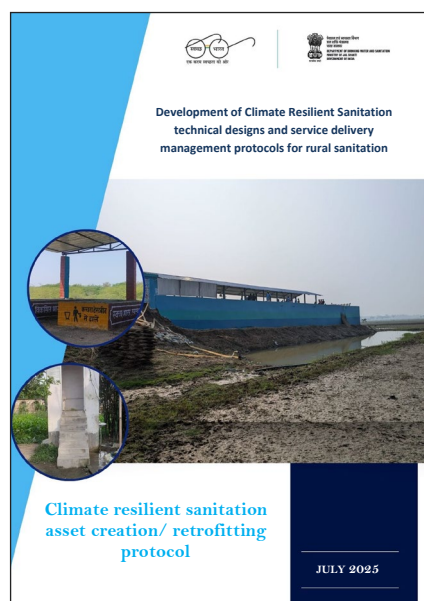
Climate change poses a potent threat to WASH infrastructure and services, particularly in vulnerable regions. India's diverse geography and hazard-prone terrains amplify this risk. To improve sanitation facilities nationwide, the Government of India launched the flagship sanitation campaign, the Swachh Bharat Mission (Clean India Mission) in 2014. The campaign's first phase concluded in 2019, with all Indian villages, states and union territories declaring themselves 'open-defecation free'. Further, the Government of India has emphasised the construction of Community Sanitary Complexes (CSCs) along with Solid and Liquid Waste Management in the Swachh Bharat Mission Phase-II.

Developing robust sanitation designs and community-centric service delivery protocols that can withstand climate shocks requires building the capacities of local officials to plan, manage, and maintain these systems and ensure long-term resilience. Against this backdrop, UNICEF is supporting the Government of India in the '*Development of Climate Resilient Sanitation (CRS) Technical Designs and Service Delivery Protocols for Rural Sanitation*' under the framework of the Swachh Bharat Mission Phase-II. The focus is on two thematic areas, infrastructure and service delivery, covering three key phases of climate action: preparedness, response, and recovery.

The Climate Resilient Sanitation Asset Creation and Retrofitting Protocol was published in July 2025. The purpose of this protocol is to ensure continuity of sanitation assets in an efficient manner in the face of a changing climate. The specific objectives of the protocol are as follows:

- To set out the activities required for the creation and retrofitting of climate-resilient sanitation assets in rural areas of India.
- To develop drawings, designs and estimates for climate-resilient sanitation assets in flood-, drought-, and cyclone-prone rural areas.
- To elaborate on the supportive actions required for the implementation of the proposed designs and estimates for climate-resilient sanitation assets on the ground.

The protocol includes community and gender inclusion measures as part of the checklist for monitoring the construction of climate-resilient sanitation infrastructure. This checklist outlines specific actions to ensure inclusivity (e.g., accessible toilets and menstrual hygiene-friendly designs), ensuring safe access routes, adequate lighting, and privacy, and involving community members in monitoring and feedback processes. These measures collectively promote equitable access, safety, and participation of all community members, especially women and vulnerable groups, in sanitation planning, implementation, and service delivery.



Target users of the protocol include local governments, rural planners, engineers, contractors, and NGOs involved in sanitation infrastructure development. This protocol is also intended for community leaders, decision-makers, and DRM professionals seeking to integrate climate resilience into sanitation systems. Additionally, it serves as a resource for policymakers and academic institutions aiming to adopt or promote sustainable and adaptive practices in sanitation asset design, construction, and retrofitting.



Location
India

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ENTRY POINTS FOR INTEGRATING GENDER CONSIDERATIONS IN RESILIENT INFRASTRUCTURE

Developed by the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR), this report highlights the necessity of integrating gender-responsive approaches into the design and implementation of resilient infrastructure. Utilising the World Bank's [Gender Tag methodology](#), the report identifies gender gaps and proposes targeted interventions to monitor progress in closing those gaps.

This report presents a strategic framework for mainstreaming gender into resilient infrastructure development, focusing on the transportation, water, and energy sectors. It is intended primarily for transportation policymakers and planners, as well as other infrastructure and DRM professionals responsible for mainstreaming gender into sectoral planning and implementation. The aim is to enhance disaster resilience while promoting gender equality, aligning with the commitments of the GFDRR and the World Bank Group's initiatives in inclusive DRM and gender equality. To operationalise these objectives, the report examines key gender-related challenges and opportunities within three critical sectors:

- **Transportation:** Women face significant barriers in mobility, safety, and accessibility, particularly during disasters. The report recommends financial support for women's transportation during emergencies, community-based transportation networks, and improved safety measures. These interventions aim to ensure that transportation infrastructure is inclusive, resilient, and supports women's economic activities during and after disasters.
- **Water:** Access to safe sanitation facilities is often limited for women, particularly during disasters. The report advocates for the provision of safe sanitation facilities, distribution of menstrual hygiene products, and inclusive decision-making forums. These measures are designed to improve women's health,



Entry Points for Integrating Gender Considerations in Resilient Infrastructure

June 2024



GFDRR



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safety, and participation in water management, thereby enhancing community resilience.

- **Energy:** Women have limited access to renewable energy resources and face health risks from traditional cooking methods. The report suggests training programmes for women in renewable energy, promotion of clean cooking solutions, and gender-responsive policies. These interventions are aimed at reducing health risks, improving women's economic opportunities, and ensuring sustainable energy access during disasters.

The report emphasises the need to develop transportation and water infrastructure that prioritises women's safety and accessibility, advocates for women's participation in policymaking processes, and provides targeted employment and training programmes in the transportation, water, and energy sectors. Additionally, promoting community-led initiatives with women in leadership roles is crucial for improving disaster preparedness and response. While not intended as a comprehensive framework, the report offers useful entry points and operational examples for teams working at the intersection of gender, DRM and climate resilience. It supports practitioners and policymakers in designing infrastructure that is inclusive, adaptive, and responsive to the needs of all people.

Project owner

World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR)

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STRENGTHENING INTEGRATION OF GEDSI-CLIMATE DATA FOR INFRASTRUCTURE DEVELOPMENT

High-quality, accessible data on climate hazards, exposure, and vulnerabilities are vital for evidence-based decision-making that supports climate-resilient and equitable infrastructure. While challenges remain, there is growing recognition of the need to strengthen data systems that capture the social dimensions of vulnerability, particularly GEDSI, alongside environmental and climate variables.

Recent analysis highlights that persistent evidence gaps exist at the intersection of gender, climate, and health, with climate datasets seldom including intersectional data necessary for equitable policy and planning.¹ When looking at disability, disaggregation remains inconsistent, with limited data by disability type, gender, or socio-economic status. For all GEDSI data more broadly, variations in definitions and collection methodologies, particularly around disability and social inclusion, undermine comparability across regions and sectors. Data timeliness and geographic coverage are also major challenges, as many global databases are updated infrequently or lack sufficient local resolution to guide infrastructure decisions. Technical constraints further complicate efforts to merge datasets from different sources due to mismatched spatial units, formats, or reference years.² In addition, most environmental data are collected at the household rather than the individual level, making it difficult to capture gender differences in access and vulnerability within households. Inconsistent data collection standards, limited disaggregation by GEDSI and the challenges of collecting data in climate-affected environments further constrain the production of comparable, intersectional statistics.³

Although GEDSI-related data have historically been fragmented across institutional silos or constrained by inconsistent standards, emerging initiatives demonstrate how social and environmental data can be better integrated.

Platforms such as the [World Bank Climate Change Knowledge Portal](#) and the [OECD Environment at a Glance Dashboard](#) provide strong foundations for climate and environmental indicators, while efforts such as the [World Bank Gender Data Portal](#) demonstrate the value of sectoral disaggregation.

Momentum is also building to bridge evidence gaps at the nexus of gender, climate, and health.

The Social Vulnerability Index to environmental hazards combines socio-economic, demographic, and disability indicators with hazard exposure to map community vulnerability.⁴ [The Inclusive Data Charter](#) (IDC) mobilises political commitments, collaboration, and knowledge-sharing to advance inclusive and disaggregated data so that governments and organisations better understand, address, and monitor the needs of marginalised people. [The Gender and Environment Data Alliance](#) (GEDA) works to improve the accessibility, quality, and use of gender-environment data by compiling and curating evidence at the intersection of gender equality, environmental sustainability, and climate action. UN Women's COP28 [Call to Action](#) on sustainability to all advocates for increased investment, ethical data production, and inclusive governance to ensure that gender-environment data are systematically generated and applied in policy, programming, and research. The [IUCN Gender and Environment Resource Center](#) promotes learning and informs action by sharing resources, tools, and partnerships, while its [Environment and Gender Information](#) (EGI) platform helps fill critical data gaps to support gender-responsive environmental and climate policies, offering analyses that track both progress and persistent challenges in the gender-climate nexus.

The [World Bank Disability Data Hub](#) covers 63 economies and allows users to explore data by type of functional difficulty, severity, age, gender, and urban or rural setting. It provides indicators across education, employment, health, water and sanitation, and standards of living, which can be combined with infrastructure and climate datasets to assess vulnerability and inclusion. Similarly, the [Disability Statistics – Estimates \(DS-E\) Database](#) offers internationally comparable data for around 40 countries and over 6,500 subnational locations, covering indicators such as health, education, and multidimensional poverty among persons with and without disabilities. Together with gender-disaggregated datasets such as the World Bank

Gender Data Portal, these resources allow planners to conduct intersectional analysis and inform climate-resilient infrastructure planning.

Integrated datasets that combine climate, social, and infrastructure information present significant opportunities for advancing inclusive and resilient development. By linking disaggregated data on disability, gender, income, and health with climate and infrastructure indicators, planners and policymakers can identify communities that are disproportionately exposed to climate hazards or underserved by essential services. Such integration enables vulnerability mapping at local and regional scales, highlights service access gaps, and supports monitoring of whether investments in adaptation and resilience are equitably benefiting marginalised groups. These datasets also enhance transparency and accountability, allowing decision-makers to track the distribution of climate and infrastructure funding and to design projects that contribute not only to economic productivity but also to social equity and climate resilience.

Strengthening collaboration among governments, international organisations, and civil society can help ensure that integrated, disaggregated data becomes a cornerstone of climate-resilient infrastructure planning - one that recognises and responds to the diverse needs of all communities.

1. van Daalen, K. R., Jung, L., Dada, S., Othman, R., Barrios-Ruiz, A., Malolos, G. Z., Wu, K.-T., Garza-Salas, A., El-Gamal, S., Ezzine, T., Khorsand, P., Wyns, A., Paniello-Castillo, B., Gepp, S., Chowdhury, M., Santamarta Zamorano, A., Beagley, J., Oliver-Williams, C., Debnath, R., Bardhan, R., ... Lowe, R. (2024). Bridging the gender, climate, and health gap: The road to COP29. *The Lancet Planetary Health*, 8(12), e1088–e1105. [Link](#).
2. OECD (2025). Mind the SDG data gaps. OECD Publishing. [Link](#).
3. Data2X. (2023). Mapping Gender Data Gaps in the Environment and Climate Change: A 2023 update. [Link](#).
4. McCullagh, D., Cámara-García, W., Dunne, D., Nowbakht, P., Cumiskey, L., Gannon, C., & Phillips, C. (2025). Development of a social vulnerability index: Enhancing approaches to support climate justice. *MethodsX*, 14, 103290. [Link](#).



GENDER DIMENSIONS OF DISASTER RISK AND RESILIENCE: EXISTING EVIDENCE

Developed by the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR), the *Gender Dimensions of Disaster Risk and Resilience: Existing Evidence* report examines how gender dynamics influence disaster exposure, vulnerability, preparedness, and coping capacity. It reviews existing global evidence and data to understand how men, women, boys and girls are differently affected by disasters, how they prepare for them, and how they recover. The analysis draws from case studies, comparative data, and literature across various contexts and hazard types.

The report uses a conceptual framework that connects gender inequality and disaster impacts. It explains how gendered interactions shape outcomes during and after disasters and can reinforce preexisting inequalities. The framework shows that the intersection between disaster risk and gender inequality is where differentiated impacts arise and where DRM interventions should focus.

The report identifies major data limitations, particularly the lack of sex- and age-disaggregated data and individual-level assessments of disaster losses. It emphasises that DRM policies must account for gender dynamics to reduce impacts effectively and avoid widening existing inequalities.

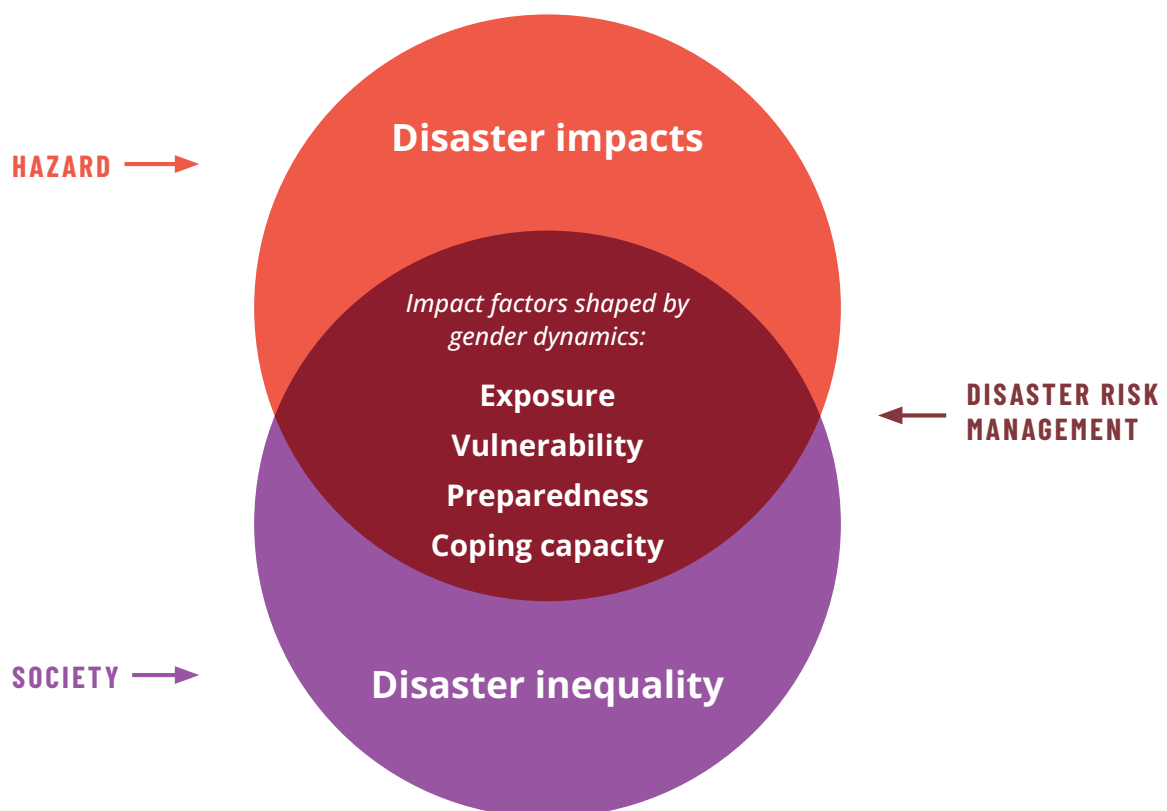


It recommends a set of policy actions in exposure, vulnerability, preparedness, and coping capacity for use before, during and after a disaster to mitigate differentiated impacts for men, women, boys and girls. The cross-cutting key messages are:

- Identifying a gender gap in disaster outcomes (for example, in mortality) but not what drives them, is a lost opportunity for creating effective policies and interventions.
- Community involvement is key to channeling preparedness and early warning information, and women's participation in this process is crucial.
- Increasing female representation in DRM and civil protection agencies helps legitimise and support women's contributions to DRR and resilience.
- Social protection is an increasingly important policy for addressing disaster vulnerability and can be carefully used to mitigate gender-differentiated disaster impacts.
- Disaster reconstruction is an opportunity to build back in a way that breaks down the constraints faced by women.
- Undertaking a local assessment helps identify gaps and barriers that make natural disasters particularly harmful for certain populations before policy agendas are set.

Next steps for this work can be organised around both analytical and operational priorities. Analytically, priorities include closing data gaps, moving beyond anecdotal evidence, conducting rigorous impact evaluations, and using new technologies such as mobility data to study gendered disaster behaviours. Operationally, countries should establish consistent frameworks for local gender gap assessments to guide inclusive, evidence-based DRM and resilience planning.

A conceptual framework for considering gender dynamics and disaster impacts
adapted from World Bank 2012 and Hallegatte et al. 2017.



Project owner

World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR)

[READ MORE](#)

PLACING GENDER EQUALITY AT THE CENTRE OF CLIMATE ACTION

Gender and climate change are intimately linked, and promoting sustainable development requires addressing both challenges together. The transition to greener economies can create new opportunities for women, provided that an intentional mix of gender-inclusive policies and interventions is put in place to ensure women's participation. Women's presence in local climate change responses is associated with better resource governance, conservation outcomes, and disaster readiness. Yet women are systematically under-represented in decision-making.

Evidence on the effectiveness of gender-smart and climate-smart development interventions remains fragmented. Developed by the World Bank, this policy note investigates how gender equality and climate change intersect; explores programmatic experience on the gender-climate nexus; identifies promising entry points and solutions; and offers recommendations for development practitioners, policymakers, and businesses.



The recommendations are organised into four groups: strategic, financing and investment, institutional and policy, and thematic and sectoral actions.

STRATEGIC RECOMMENDATIONS

- Strengthen the understanding of the gender-climate nexus
- Build the evidence base through pilot interventions and evaluative work
- Ensure the gender-climate nexus is fully integrated and tracked
- Continue to address the root causes of gender inequality that place women at greater risk of climate vulnerability

FINANCING AND INVESTMENT

- Significantly scale up financing for gender-smart climate action
- Explore innovative private sector financing instruments
- Increase concessional and blended finance mechanisms
- Invest in women-founded or -led green and climate businesses

INSTITUTIONS, POLICY, AND REGULATION

- Apply a gender lens across all climate programmes and policies
- Support participatory practices in climate dialogues
- Promote women's leadership and decision-making capacity

THEMATIC AND SECTORAL RECOMMENDATIONS

- Share best practices and replicate and scale effective solutions
- Promote green employment and entrepreneurship
- Ensure gender-smart design in social protection and livelihoods diversification measures
- Strengthen policy and legal frameworks protecting women from violence
- Integrate gender considerations into resilience building and DRR.

INCLUSIVE INFRASTRUCTURE FOR CLIMATE ACTION

This UNOPS publication promotes the importance of an inclusive approach to infrastructure development while addressing urgent issues of climate action. It underscores the importance of taking an intersectional approach to understanding the vulnerability of different people to climate risks in order to develop climate-compatible infrastructure that leaves no one behind. This publication explores inclusive infrastructure by investigating who the intended users are, what their needs are, why infrastructure fails to address them, and how this can be addressed to achieve inclusive and climate-compatible outcomes.

Informed by the diverse knowledge of ten INGOs working directly with women and marginalised groups, this publication explores the intersectional experiences of nine diverse groups with respect to the advantages and disadvantages they face in accessing infrastructure services and building resilience against climate change.

The findings from these consultations form the basis for the key principles of inclusive infrastructure and recommendations for action, based on an intersectional perspective and focused on the root causes of socio-economic and climate vulnerability. To address identified systemic barriers, five principles are set out to embody inclusive infrastructure.

The five principles of inclusive infrastructure are:

- **Equitable:** provides fair and just access to infrastructure services that can address the diverse needs of people for improved resilience and adaptive capacity to tackle climate change;
- **Accessible:** provides user-centric solutions for diverse users to have access to resilient infrastructure services in an easy, safe and dignified manner, without risk of accident or violence;
- **Affordable:** increases the opportunities for people of different economic means to access good quality, sustainable and resilient infrastructure services;
- **Do-no-harm:** reduces the exposure of people and the environment to negative social, economic or physical impacts as a result of infrastructure development or climate change; and



- **Empowering:** increases the ability of a person to successfully exercise their agency, allowing them to freely make informed and sustainable decisions about their lives and act on climate issues in their communities.

To operationalise these principles, the report proposes seven action areas: mainstreaming inclusion, building stakeholder capacity, collecting people-centric data, reforming institutional frameworks, planning for universal access, supporting innovative finance and business models, and strengthening transparency.

Together, these approaches aim to align infrastructure, inclusion, and climate goals to build a sustainable future that leaves no one behind.

Following on from this report, UNOPS has published an inclusive infrastructure guidance series, which includes:

- [Guidelines for developing inclusive transport infrastructure](#)
- [Guidelines for developing inclusive WASH infrastructure](#)
- [Guidelines for developing inclusive energy infrastructure](#)
- [Guidance for developing inclusive health infrastructure](#)

GENDER PPP TOOLKIT

Public-Private Partnerships (PPPs) are key to developing sustainable infrastructure that contributes to meeting global development goals. Well-designed PPPs can improve infrastructure service delivery and management, incentivise efficiency gains, and help increase infrastructure funding and financing, all of which can result in increased access to essential infrastructure and services.

The G20 Global Infrastructure Facility's Gender PPP Toolkit, developed jointly with the Public-Private Infrastructure Advisory Facility (PPIAF) – both hosted at the World Bank Group – supports governments, upstream advisors, PPP practitioners, MDBs, and private sector stakeholders in mainstreaming gender considerations throughout infrastructure PPPs. Gender-responsive PPPs are essential for enhancing climate resilience, as they ensure that infrastructure design, delivery, and management reflect the different ways climate change affects women and men. Integrating women's perspectives and adaptive capacities in PPP planning strengthens a project's ability to anticipate, withstand, and recover from climate shocks.

Building on existing resources, the toolkit provides a practical and systematic approach to incorporating gender responsiveness across all stages of the PPP project cycle. By jointly addressing gender and climate considerations, PPPs can deliver infrastructure that meets diverse community needs, enhances adaptive capacity, and reduces vulnerability to climate risks.

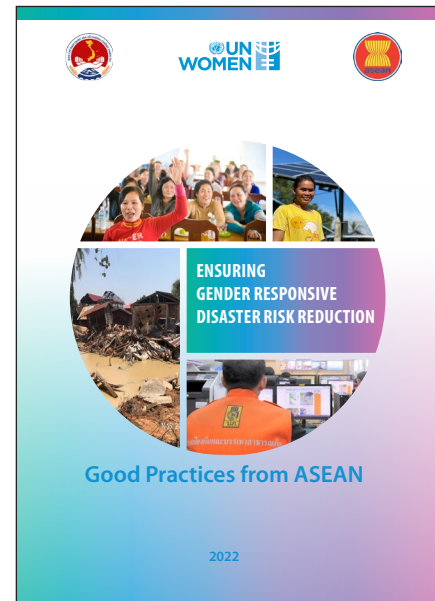


ENSURING GENDER RESPONSIVE DISASTER RISK REDUCTION: GOOD PRACTICES FROM ASEAN

This publication was jointly developed by the ASEAN Committee on Disaster Management (ACDM) and the Vietnam Disaster and Dyke Management Authority (VDDMA), with technical support from the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women). It supports the implementation of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme 2021-2025 and contributes to the ASEAN Regional Framework on Protection, Gender, and Inclusion (PGI) in Disaster Management.

The publication emphasises that disasters are not gender-neutral; different groups experience distinct vulnerabilities and capacities. Yet, they are also key actors in resilience and recovery. This publication is a compendium consolidating eight good practices from ASEAN member states, organised along the four Sendai Framework for Disaster Risk Reduction priorities of understanding disaster risk, strengthening risk governance, investing in DRR for resilience, and enhancing disaster preparedness for building back better.

Vietnam's use of sex-, age-, and disability-disaggregated data strengthens inclusive policymaking and disaster response. Thailand's development of a Gender and Disaster Risk Reduction Profile institutionalises gender analysis in risk governance.



Indonesia and the Philippines demonstrate strong legal and institutional frameworks that embed gender equality in disaster management. Lao People's Democratic Republic's technology-based school safety assessments and Cambodia's renewable energy initiative linking women's economic empowerment with resilience showcase innovation in gender-responsive investment. Meanwhile, Lao's gender-responsive post-disaster needs assessment and Vietnam's women-led preparedness programmes highlight how women's leadership drives effective response and recovery.

These good practices reflect the collective efforts of ASEAN Member States to translate regional and global commitments, such as the Sendai Framework and the ASEAN Agreement on Disaster Management and Emergency Response, into gender-responsive action.



Location

Member states of the Association of Southeast Asian Nations (ASEAN)

[READ MORE](#)

GUIDE ON INTEGRATING GENDER THROUGHOUT INFRASTRUCTURE PROJECT PHASES IN ASIA AND THE PACIFIC

Infrastructure projects that successfully mainstream gender must consider all stages of the project lifecycle, from start to finish. Jointly commissioned by UNOPS and UN Women, this guide is designed to provide practical guidance on gender-responsive and socially-inclusive infrastructure throughout six phases of the project lifecycle: design and preparation; financing and budgeting; procurement and contracts; implementation; operations and maintenance; and monitoring. Aimed at UN Women and UNOPS personnel in the Asia-Pacific region, as well as other UN agencies, partners, and technical specialists involved in infrastructure development and gender equality, the guide serves as a comprehensive resource for integrating gender considerations across all project stages.

This resource provides an introduction to the UN gender mainstreaming principles, why it is important to mainstream gender, the business case for gender mainstreaming, and an overview of the project lifecycle. Importantly, the most important considerations for gender mainstreaming and social inclusion are identified for each lifecycle phase, alongside tools and checklists to implement them.

The publication emphasises that gender-responsive and socially-inclusive infrastructure plays a critical role in DRR and climate change adaptation. It outlines practical measures to strengthen community resilience and ensure that women, men, and marginalised groups are active agents in mitigating and responding to climate-related risks.



A featured case study on the [Bangladesh Coastal Climate-Resilient Infrastructure Project](#) of the Asian Development Bank demonstrates how gender mainstreaming was integrated into climate-resilient infrastructure design and implementation. The project involved women and women's organisations in planning and siting infrastructure, drawing on their knowledge for climate change adaptation. Efforts to climate-proof and protect roads from flooding took into account women's travel patterns and aimed to improve their mobility and access to markets and services. Photovoltaic lighting was installed in women's shops, toilets and along streets to enhance safety, and cyclone shelters were constructed with separate facilities and spaces to ensure women's privacy and protection.

The guide is part of a series of [Guides on Integrating Gender into Infrastructure Development in Asia and the Pacific](#). The series is intended to provide practical guidance that demonstrates both the 'why' and the 'how' of integrating gender within infrastructure subsectors and across project phases.

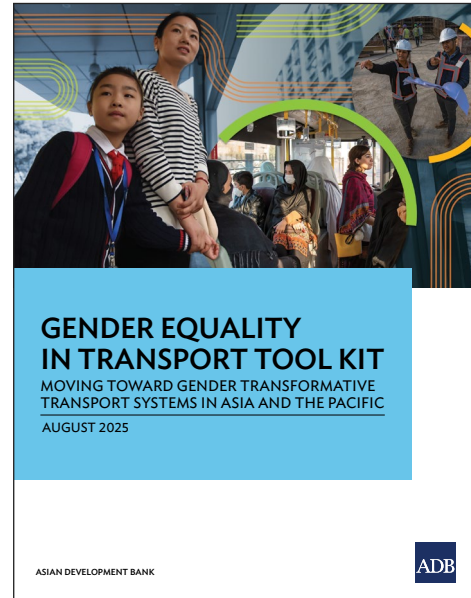
GENDER EQUALITY IN TRANSPORT TOOLKIT

The *Gender Equality in Transport Toolkit: Moving Toward Gender-Transformative Transport Systems in Asia and the Pacific* supports stakeholders in integrating gender considerations into transport projects, addressing the distinct travel needs and challenges faced by women and girls. It focuses on using transport initiatives as entry points to influence broader policies and upstream actions.

Women and girls' travel needs differ from those of men and boys due to their disproportionate responsibility for unpaid household and care work. They often travel with dependents, make multiple stops, and rely more on shared or public transport because of lower incomes and limited control over financial resources. Across contexts, women face restricted mobility, harassment in public transport, and low representation in transport employment. As transport systems become increasingly vulnerable to climate change, women, especially those using non-motorised and shared modes, are disproportionately affected. Advancing gender equality, therefore, requires a gender-just transition to low-emission, climate-resilient transport and stronger collection of sex-disaggregated data to inform inclusive solutions.

The toolkit provides comprehensive guidance for integrating gender perspectives throughout the transport project lifecycle. It outlines approaches for identifying gender gaps and developing performance indicators and actions that promote women's empowerment and gender equality. It further details modalities for implementation, monitoring and evaluation of gender impacts, and mitigation of potential risks. The annexes complement the main chapters with practical guidance on mainstreaming gender equality across ADB's upstream work and project lifecycle, designing gender-sensitive transport infrastructure, and integrating inclusivity and safety considerations into street maintenance.

Case examples from across Asia and the Pacific illustrate the region's diverse contexts, challenges, and opportunities in promoting gender equality in transport. The following examples demonstrate how climate-resilient and gender-responsive transport initiatives can advance more equitable and sustainable mobility across the region.



- The ADB-financed [Nagpur Metro Urban Mobility Project](#) (India, 2024) focuses on developing gender-inclusive infrastructure in the metro rail network, such as childcare rooms in stations, to increase women's access to public transport. It also promotes skills development and offers training programmes and internships to improve employment opportunities for women.
- Bhutan's Low Emission Development Strategy for Surface Transport (2021) demonstrates how low-carbon transport strategies can advance gender equality, introducing women-friendly public transport services, improving women's safety and working conditions, and promoting women's participation in electric mobility and entrepreneurship.
- ADB's [Gender Equality and Climate Change Sectors Guide](#) underscores the importance of integrating gender equality across infrastructure sectors, including transport, as part of a low-carbon and climate-resilient transition. It highlights key gender issues within the context of climate change and provides guiding questions and sample performance indicators that can strengthen project design, ensuring that women's mobility, employment, and leadership are central to sustainable transport solutions.



PROMOTING INCLUSIVE APPROACHES TO COOPERATION AND COORDINATION IN DISASTER RESPONSE: HIGHLIGHTS FROM PIARC TC1.5 DISASTER MANAGEMENT

Increasingly, countries are recognising that incorporating diverse voices, community perspectives, and gender inclusion into disaster management planning and implementation is essential for bringing inclusivity to the forefront of disaster management and enhancing the resilience of infrastructure. This reflects a broader movement toward inclusive, participatory, and socially aware models of resilience.

The World Road Association (PIARC) highlighted gender inclusion and diversity as a cross-cutting value within its Strategic Plan in 2021. As part of this work, Technical Committee (TC) 1.5 Disaster Management has progressed on topics such as gender-inclusive infrastructure design, disaster response coordination, and the importance of capacity building and removing gender biases in transport projects.

In particular, key findings from TC1.5 include:

- The importance of strategic decision-making, policy and governance being carried out via a gender-inclusion perspective from the very start.
- Availability and use of good quality disaggregated data in disaster response is critical.
- The vital role of stakeholder engagement and collaboration in the early stages of disaster management, with all vulnerable groups and communities, and at all levels of response.
- The challenges and opportunities to promote and provide equitable roles to all, across all phases of disaster management, empowering women in science, technology, engineering, and management roles in the community

The urgency of gender-responsive infrastructure is underscored by lessons from the 2011 Great East Japan Earthquake and the 2024 Noto Peninsula Earthquake. In studies undertaken by Japan, it is evident that women and caregivers

face exclusion both in daily infrastructure use and during emergencies. Specifically, regarding shelter, one case highlighted the lack of pre-established gender-safe spaces. To address these issues, key recommendations include training and empowering female engineers, redesigning evacuation shelters to ensure safety and privacy for women and embedding inclusive design standards within national disaster management frameworks. Such measures would help place the needs of women and caregivers at the centre of disaster preparedness and response mechanisms.

Other case studies included addressing the needs of First Nations People and increasing the resilience of infrastructure post-disaster to reconnect communities. This can also involve intensive stakeholder engagement programmes implemented from the outset, via inclusionary stakeholder engagement models. Other impactful and necessary considerations include the collation and use of disaggregated data before and during a disaster response, on the ground, gathering vital data from all groups affected and identifying the different needs of disaster responders, victims and planners.

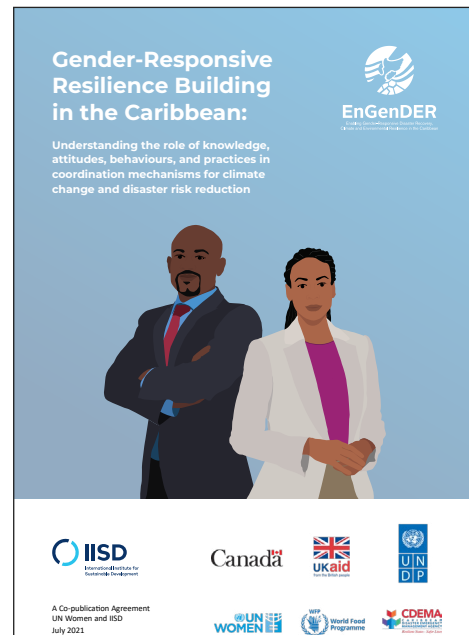
These case studies underscore the vital role of stakeholder engagement and collaboration in promoting equitable participation across all phases of disaster management. Building resilience requires empowering vulnerable groups, including women and First Nations communities, the elderly, persons with disabilities, those facing language barriers, individuals who may encounter digital challenges, and other marginalised groups, by ensuring their meaningful involvement in science, technology, engineering, and management roles. By fostering inclusivity, societies can create more equitable, adaptive, and resilient disaster management systems for the future.

GENDER-RESPONSIVE RESILIENCE BUILDING IN THE CARIBBEAN

A knowledge, attitudes, behaviours, and practices (KABP) analysis was carried out by the International Institute for Sustainable Development (IISD) on behalf of UN Women, under the [EnGenDER Project](#). The study aimed to deepen understanding of gender-related perceptions and biases and how these affect coordination mechanisms for climate change adaptation and DRR. This understanding provides a foundation for identifying ways to challenge these biases at both individual and institutional levels.

The analysis was developed based on data from nine countries: Antigua and Barbuda, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, and Suriname. The participants included representatives of institutions responsible for gender equality, and coordinating and sector ministries involved in implementing climate and DRR actions. The findings and recommendations will be of interest to government representatives and stakeholders working on integrating gender considerations in climate change adaptation and DRR in these countries and beyond. Results from the analysis can be explored in an [interactive infographic](#).

Based on these insights, the analysis outlines a set of practical recommendations to help institutions responsible for climate change and DRR in the target countries create environments that actively promote gender equality and inclusion:



1. Raise awareness of gender policies and mandates across different institutions
2. Foster a safe and inclusive workplace culture
3. Promote continuous learning by investing in gender training and mentoring
4. Create incentives for positive behaviours and practices related to gender equality
5. Put institutional mechanisms in place to support gender-responsive approaches
6. Build accountability by tracking and reporting on progress, both internally and externally

MAINSTREAMING GENDER AND DISABILITY INCLUSION IN SDG 11 IMPLEMENTATION THROUGH INCLUSIVE URBAN DEVELOPMENT IN INDIA

The United Nations in India (UN India) and the National Institute of Urban Affairs (NIUA) under the Ministry of Housing and Urban Affairs (MoHUA) aimed to mainstream gender and disability inclusion into India's urban development agenda, contributing to the realisation of SDG 11 (Sustainable Cities and Communities). Focusing on three primary components – policy and planning, capacity-building, and knowledge generation – UN India and NIUA developed policy and planning tools alongside knowledge products to support smart cities in becoming more inclusive and resilient in the face of social, economic, and environmental challenges. These outputs support embedding GEDSI into urban development processes, ensuring that urban infrastructure is accessible to all, with a particular focus on marginalised communities, including women, persons with disabilities, the elderly, children and other gender-diverse individuals.

These efforts were driven by the recognition that urban development, in many cases, has not adequately addressed the specific needs of these groups, leading to barriers in access, safety, and full participation in urban life. OPDs, gender rights experts, and persons with disabilities actively co-created and reviewed the outputs, ensuring that their lived experiences informed the solutions. This co-creation process helped ensure that the strategies developed were responsive to the needs of marginalised communities.

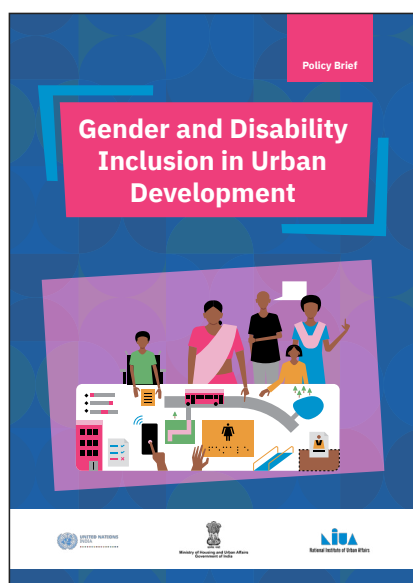


Guide on Accessible, Inclusive, Safe and Resilient Urban Development

Intersectionalities within marginalised groups increase their vulnerability to climate change. Universal design and accessibility of infrastructure are the most critical aspects in building climate resilience within vulnerable groups of persons with disabilities. This resource aims to embed Universal Design principles into urban planning and provides guidance for cities on adopting an inclusive response to climate-induced disasters. For example, collecting disaggregated data based on age, gender, disability, etc., can ensure inclusive provisions in climate change mitigation and adaptation plans, and participation of marginalised groups in climate policy formulation will ensure that their voices are heard and their needs are addressed.

By integrating GEDSI considerations into the infrastructure lifecycle, this guide demonstrates how inclusive urban planning can strengthen resilience to climate hazards, reduce inequalities, and contribute to inclusive DRR. The guide is available in Hindi, English, and 15 other regional languages to enhance accessibility.

Additionally, [a digital toolkit](#), based on the guide, was developed as a visually accessible, easy-to-understand reference guide for urban planners, helping them integrate inclusive design principles throughout all stages of urban development, offering sector-specific guidelines, monitoring tools, and strategies for inclusive resilience. It includes interactive sector-specific isometric sketches with simplified checklists highlighting the essential criteria for accessibility and inclusion, making it easier to create accessible, inclusive, and resilient urban spaces.



Policy Brief on Gender and Disability Inclusion in Urban Development

This policy brief addresses the urgent need for policies that prioritise gender and disability inclusion in urban strategies to combat climate change and DRR. It highlights specific vulnerabilities faced by women, girls and persons with disabilities in the city, and advocates for inclusive and participatory planning approaches which are gender transformative and aimed at the ethical and meaningful inclusion of women, girls and persons with disabilities in the city.

It proposes a multi-pronged approach for systemic reform that includes legislative and policy changes aimed at strengthening local institutions, promoting decentralised participatory planning and design, increasing political representation of women and persons with disabilities in planning and governance, and capacity building, training and sensitisation at various levels.

In particular, the policy brief focuses on designing safe, accessible and affordable urban transport and mobility infrastructure that accounts for the needs of women, children, persons with disabilities and their caregivers, focusing on non-motorised transport and last-mile connectivity. In addition to this, it recommends extensive WASH coverage with public sanitation facilities that are free and accessible, and robust digital infrastructure that is accessible and affordable.



Compendium of Smart and Innovative Solutions for an Inclusive and Accessible Urban Future

Through the launch of the Smart Solutions Challenge and Inclusive Cities Awards, NIUA and UN India aimed to involve citizens in the nation-building process by crowd-sourcing innovative ideas, technologies, products, and business solutions that can:

- Break down and resolve the complex city-level inclusion and accessibility challenges faced by women and girls, the elderly, and persons with disabilities; and
- Be easily adopted and implemented by cities for mainstreaming gender and disability inclusion into urban planning for creating inclusive, accessible, safe, and resilient urban spaces.

This compendium showcases solutions that were shortlisted for the awards, featuring 41 innovative approaches to address city-level GEDSI challenges through inclusive development across urban areas in India. It includes solutions across three categories: early-stage Innovations, market-ready solutions, and good practices, and was developed and shared with smart cities across the country.

Through these resources and their associated activities, UN India and NIUA are contributing to the global efforts of achieving SDG 11, ensuring that urban spaces in India are inclusive, accessible, and resilient, with an emphasis on social inclusion. The outputs have provided valuable tools and resources for other cities seeking to integrate GEDSI considerations into their development frameworks and ensure that urban development leaves no one behind.

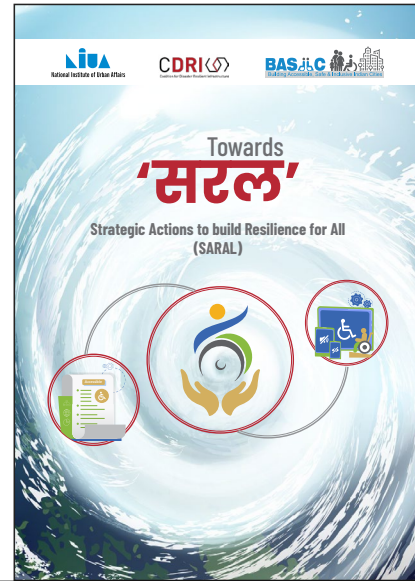


STRATEGIC ACTION TO BUILD RESILIENCE FOR ALL (SARAL)

Disasters do not affect everyone uniformly. Persons with Disabilities (PwDs) have a two to four times higher mortality rate in acute-onset disasters due to their inherent vulnerability and various barriers, emphasising the need to have an inclusive approach to resilience. Despite robust policy frameworks at the international, national, state and district levels, disability-inclusive DRR remains limited in practice.

Strategic Action to Build Resilience for All (SARAL) is an initiative by NIUA, taken up under the CDRI fellowship, that aims to mainstream disability inclusion across all phases of disaster management. Focusing on Berhampur and Gopalpur in Odisha's Ganjam district in India, the research employed primary surveys, stakeholder consultations, accessibility audits, and community-level assessments to generate evidence-based insights.

The SARAL initiative introduces Community Level Disaster Management Plans (CLDMPs) as a means to strengthen inclusive and community-based resilience. The CLDMP framework identifies susceptibility to disasters, economically, socially, and physically vulnerable areas, and the location of individuals with compounded vulnerabilities and their needs and challenges. It also maps temporary and permanent shelters and evacuation routes, and outlines operating procedures before, during, and after disasters. The approach builds networks of leaders and volunteers from the community, promotes localised and timely dissemination of information, and supports the creation of accessible surge and community infrastructure. By integrating inclusive provisions in relief and rehabilitation and emphasising a bottom-up approach, CLDMPs contribute to developing community awareness, enhancing preparedness, and ensuring that disaster management remains inclusive and context-specific.



The SARAL initiative highlights the criticality of 'ACT' on the three key components - People, Process, and Practice - to mainstream disability inclusion in climate resilience. The study highlights strong community cohesion in rural areas, a need for localised urban strategies, and the critical role of disaggregated data and accessible infrastructure. The outcomes provide a replicable and scalable model for integrating disability inclusion into DRR, bridging the gap between national policy and local implementation, and reinforcing the commitment to leave no one behind.

2.3

COLLABORATIVE INITIATIVES

Systemic problems require systemic solutions; the collective challenge of climate change demands a collaborative approach to problem-solving that spans sectors, regions, and disciplines. This will help to bridge divides between practitioners, communities, and governments, and catalyse key actors into moving forward on adaptation and mitigation measures. Allowing for diverse contributions to problem-solving will result in solutions that are holistic, transferable, and inclusive at their core.

ADVANCING GENDER SMART SOLUTIONS IN CLIMATE AND DISASTER RISK FINANCE AND INSURANCE

The Centre of Excellence on Gender-smart Solutions (CoE) is a global platform advancing gender considerations in climate and disaster risk finance and insurance (CDRFI). Launched at COP26 in 2021, the CoE empowers practitioners and communities to mainstream gender into CDRFI solutions that build equitable resilience. The CoE builds a knowledge base, provides technical guidance, supports capacity development, and connects actors across sectors to foster inclusive approaches to climate and disaster risk.

The CoE operates under four strategic pillars: Knowledge and Evidence, Guidance, Opportunity, and Community. These pillars frame its work to strengthen inclusive CDRFI practices and influence systemic change.

1. Under the **Knowledge and Evidence** pillar, the CoE curates and generates research that strengthens evidence-based policymaking. It offers a growing library of publications, including case studies, policy briefs and working papers, that demonstrate how gender-smart CDRFI approaches improve financial protection and resilience for marginalised groups. This body of work also highlights critical gaps and entry points for mainstreaming gender across CDRFI systems. Most recently, the CoE has commissioned a Gender Analysis of CDRFI in 11 [Global Shield](#) countries and one region, beginning with [Costa Rica](#), to identify systemic and institutional barriers that prevent equitable access to risk finance. These findings support partners to prioritise reforms grounded in user needs and lived realities.
2. The **Guidance** pillar focuses on translating evidence into practical tools and technical resources for implementers. The CoE provides demand-driven advisory support to stakeholders designing or scaling gender-responsive instruments and policies. These resources provide step-by-step guidance tailored to various institutional contexts, enabling actors to transition from intention to application. With support from the [Technical Advisory Facility](#), nine institutions and two government entities advanced their activities. For example, the Pacific

Insurance and Climate Adaptation Programme (PICAP) strengthened its approach to reach underserved groups, including women, persons with disabilities, and social protection recipients. In Costa Rica, insurers who participated in the gender-awareness training workshop have been inspired to develop gender-responsive Climate Risk Insurance products aligned with local needs.

3. Through the **Opportunity** Pillar, the CoE seeks to strengthen the technical and operational capacity of stakeholders working at the intersection of gender and CDRFI. This includes a fellowship programme in partnership with Women's World Banking (WWB) and the Access to Insurance Initiative (A2ii), through which 22 financial regulators from the Africa, Latin America and Asia regions have been supported with scholarships to participate in the Women's World Banking Leadership Program for Regulators. Alumni are applying their learnings, with one participant from Ghana already advancing with a policy requiring at least 30% women's representation on the boards of (re)insurance companies.
4. The **Community** pillar anchors the CoE's global network of experts and practitioners. The Expert Directory connects users to professionals who bring deep technical knowledge in gender-responsive CDRFI. The Community of Practice (CoP) offers a collaborative environment for peer learning and joint problem-solving, allowing participants to exchange knowledge, share lessons, and co-create solutions. Through its LiveTalks series, the CoE convenes global experts to share insights and build a shared understanding of what works in gender-smart CDRFI.

Through this collaborative model, the CoE strengthens the enabling environment for gender-responsive risk financing and supports partners in translating knowledge into practical action. By linking evidence, practice, and peer learning across regions, the CoE motivates partners to improve CDRFI systems to ensure financial protection for women and vulnerable groups, while enhancing resilience to climate and disaster risks.



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THE COMMONWEALTH COLLABORATIVE NETWORK FOR GENDER-RESPONSIVE CLIMATE ACTION

The Commonwealth Collaborative Network for Gender-responsive Climate Action is a strategic initiative that supports Commonwealth member countries in delivering the long-term goals of the Paris Agreement in an inclusive and gender-responsive manner. It connects climate change and gender experts across the Commonwealth, along with key stakeholders, to help integrate gender into the planning and implementation of National Climate Plans.

The Collaborative Network advances gender-responsive climate action through three core objectives:

1. Bridging knowledge gaps by increasing the availability and use of gender-disaggregated data to better understand how climate change affects women and men differently.
2. Promoting equitable access to climate finance by supporting the development of funding proposals that mainstream gender or explicitly prioritise gender equality.
3. Strengthening diverse leadership by encouraging the participation of both women and men in climate-related decision-making roles.



Initiatives are delivered through the Commonwealth Climate Finance Access Hub (CCFAH), which supports: the development of climate change project pipelines in member countries, strengthening the capacity (human and institutional) of key ministries and agencies mandated to attract and manage climate finance, leveraging available technology, providing technical support for a conducive climate policy environment, facilitating learning and knowledge exchange, and advancing the Secretariat's climate finance advocacy. CCFAH's support extends beyond policy advice to shaping critical infrastructure systems, ensuring that they are inclusive, resilient, and aligned with GEDSI principles.

One such example is an initiative to develop gender-responsive, climate-resilient health infrastructure in Namibia that targets the Green Climate Fund (GCF) as a financing agency. This initiative is being developed as part of a funding proposal to the GCF, the world's largest dedicated climate finance mechanism which supports developing countries in implementing low-emission, climate-resilient development. CCFAH supported the Government of Namibia in preparing this proposal and the Commonwealth Gender and Health Climate Finance Advisers provided technical recommendations to embed gender equality and equity into health system resilience in line with GCF policy requirements. The recommendations included:

- **WASH infrastructure:** promote women-led design, operation and management of WASH infrastructure and ensure water and sanitation facilities are inclusive, sustainable and more responsive to community needs with GBV-safe siting, including participatory and inclusive site selection with women and vulnerable groups, proximity to homes and safe access routes, adequate lighting and privacy, gender-segregated and lockable facilities, and integration with community safety mechanisms and GBV response services.
- **Health facilities:** training female health workers on climate-resilient service delivery, especially maternal and child health during climatic shocks.

- **Disease surveillance & early warning systems:** ensuring women's leadership and targeted outreach to female farmers and vulnerable households in view of their status as the most disproportionately affected segment of the population by climate change. Promoting women's participation and leadership in climate action not only strengthens community resilience but also enhances the effectiveness and sustainability of adaptation and mitigation interventions. This includes supporting capacity-building initiatives and ensuring they are trained in disease surveillance at the community level and EWS to strengthen their preparedness and readiness.
- **Monitoring systems:** sex-disaggregated and gender-sensitive indicators to track equitable access to health and WASH services.

These recommendations would address GBV prevention, intersectionality (e.g., indigenous women, women with disabilities, adolescent girls), and women's leadership as core resilience measures.

A second example focuses on critical digital infrastructure; the Framework for a National Data Hub for Gender and Climate Information in Nigeria, launching at COP30, is being designed as a centralised, policy-linked gender-responsive climate data platform that collects, harmonises and disseminates data that would enable the government of Nigeria to design inclusive and effective responses to mounting climate risks.

The Framework Document developed by the Commonwealth Secretariat with technical input from the National Council on Climate Change (NCCC) outlines how this Data Hub could be implemented; how it would strengthen institutional accountability; and how it would ensure that Nigeria's climate actions reflect the lived realities of its citizens. It highlights the importance of integrating gender-disaggregated data across multiple infrastructure-related sectors, including health, water, energy, agriculture and finance, and it also addresses GBV considerations, women's participation in decision-making and bridging technology gaps.

EMPOWER: WOMEN FOR CLIMATE-RESILIENT SOCIETIES

Jointly implemented by UN Women and UNEP, with support from the Governments of Germany, New Zealand, Sweden and Switzerland, the EmPower: Women for Climate-Resilient Societies programme (EmPower) aims to strengthen gender mainstreaming and human rights approaches in climate change and disaster risk actions in the Asia and the Pacific region.

The EmPower programme works on three outcomes:

1. Asia-Pacific actors increase action on gender-responsive climate change adaptation and mitigation.
2. Women in all their diversity and other marginalised groups are represented as key environmental actors in climate and DRR decision-making.
3. Women and other marginalised groups in the Asia-Pacific engage in climate-resilient livelihoods.

Through the first phase of the programme (2018-2022), UN Women, UNEP, and partners have successfully engineered alternative livelihoods for vulnerable communities, reduced emissions through renewable energy and sparked intergovernmental commitments to ensure gender-responsive policies and actions in the Asia-Pacific region. In the second phase (2023-2027), UN Women and UNEP are scaling up the lessons learned and the approaches developed.

EmPower has already delivered transformative results across policy, leadership, livelihoods and practical tools, ensuring gender and social inclusion are embedded in climate and energy infrastructure. These interventions have influenced renewable energy programmes, financial systems and clean technology deployments, which are critical components of sustainable infrastructure. They also contribute directly to SDG 5 (Gender Equality), SDG 7 (Affordable and Clean Energy), and SDG 13 (Climate Action), while supporting commitments under the Paris Agreement and national NDCs.



Interventions include:

Accelerating gender responsive climate action:

- 4,000 policymakers and private sector actors enhanced their understanding of gender and human rights in climate action.
- 34 national and regional action plans and guidelines were developed and strengthened to integrate gender equality into climate and energy policies.

Advancing women's leadership:

- 1,000 women and marginalised individuals increased their leadership and agency to influence climate and DRR policies.
- 327,000 individuals were reached through awareness-raising campaigns, increasing public understanding and support for women's leadership in climate action.

Enabling Climate-resilient livelihoods:

- 10,000 women entrepreneurs gained access to financial products and services.
- 12,000 women and small-scale enterprise actors enhanced their knowledge of integrating clean energy technologies into their businesses.

Among other resources, the programme developed a free e-learning course titled '[Gender Equality and Human Rights in Climate Action and Renewable Energy](#)', designed to provide professionals with the knowledge and tools to integrate and implement gender equality in renewable energy access and entrepreneurship, as well as to apply gender-responsive and human rights-based approaches to climate change mitigation and adaptation.

In addition, a '[Training Manual on Gender and Climate Resilience](#)', accompanied by a Training of Trainers (ToT) package, was created to strengthen the capacity of civil society organisations, particularly those working on gender and women's rights, to promote the mainstreaming of gender considerations into climate policies, programmes, and budgets at regional, national, and local levels. The manual draws examples and case studies from within the region, builds on existing materials and training, and serves as a comprehensive resource for both beginner and advanced participants. Although primarily focused on gender, it also addresses intersecting factors such as age, sexual orientation (LGBTQ+), (dis)ability, and social status, among others.

Other EmPower resources:

- [Gender-Responsive Renewable Energy Programmes](#) – featuring success stories, key findings, and lessons learned on women's leadership.
- [Renewable Energy and Women Entrepreneurship Programmes](#) – for institutions, project developers, practitioners and donors to plan and manage renewable energy projects led by women entrepreneurs for climate-resilient livelihoods.



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INCLUSIVE DISASTER RISK MANAGEMENT: ADVANCING EQUITY AND RESILIENCE IN ECUADOR

Inclusive Community Risk Management Committees (CCGRIs)

Ecuador is a multi-hazard country characterised by a complex interplay of social, economic, political, territorial, and environmental vulnerabilities that contribute to conditions of risk. These conditions are dynamic, not only due to the evolving nature of hazards, but also as a result of changes stemming from underlying vulnerabilities and limited institutional and community capacities. In response to these challenges, and grounded in the principles of self-protection, shared responsibility, and citizen participation, efforts have been made to engage communities in DRM. This has been achieved through public awareness campaigns, training programmes focused on prevention and preparedness, and the active involvement of community members in risk identification, assessment, and the planning of preventive measures.

To advance this approach, a project was launched to establish and strengthen Inclusive Community Risk Management Committees (CCGRI) (in Spanish, Comité Comunitario de Gestión de Riesgos Inclusivo), with support from the National Secretariat for Risk Management (SNGR), the Ministry of Economic and Social Inclusion (MIES), and the Decentralized Autonomous Government (GAD) of Salinas. The initiative began in September 2021 with the formation of the CCGRI in Santa Rosa, a neighbourhood of approximately 3,000 people, in the Santa Elena province 2021.

The first phase involved identifying the locations of priority populations, particularly older adults and persons with disabilities, and assessing whether they reside in risk-prone areas. These individuals were then provided with training on risk prevention measures, and the broader community was engaged in preparedness activities.

In Santa Rosa, CCGRI activities typically included around 100 individuals, including older adults, persons with disabilities, and their caregivers. Work began with 30 individuals referred to as 'users', each accompanied by their respective caregiver, who participated in workshops and training sessions.

Activities included the implementation of drills to test evacuation routes, designated assembly points, activation of Early Warning System sirens, and procedures for assisting older adults and persons with disabilities during evacuations. Following each drill, a participatory evaluation is conducted with the community to identify lessons learned and areas for improvement to ensure an effective response in the event of a real emergency. These exercises are conducted continuously and are supported by SNGR, MIES, the National Council for the Equality of Disabilities (CONADIS), and the local GAD.

The concept and operational process of the CCGRI are formally defined in Resolución SNGRE-118-2021, [Manual del Proceso: Organización y Fortalecimiento Comunitario en Gestión del Riesgo de Desastres](#), which institutionalises community risk management structures, including the CCGRI, as a mechanism for local participation and preparedness. Additionally, the [Guía para la Gestión Inclusiva del Riesgo con Enfoque en Personas con Discapacidad](#) establishes how the CCGRI must integrate inclusive approaches, particularly in identifying persons with disabilities and planning for their protection during emergencies.



Top: Community members participate in a training session on inclusive disaster risk management. © GAD Municipal de Salinas
Bottom: Evacuation drill conducted to strengthen preparedness and test inclusive evacuation. © GAD Municipal de Salinas

3. CLOSING REMARKS

The case studies, resources and initiatives in this report showcase the ways in which GEDSI considerations can be embedded across every stage of infrastructure delivery. Often considered an optional extra - or not considered at all - GEDSI principles are critical for delivering safe, accessible and just infrastructure that meets the needs of those it serves. As marginalised groups continue to bear the greatest burden of climate impacts, infrastructure practitioners and policymakers have a duty to ensure that the voices of these groups are heard, that their lived experiences are understood, and that their quality of life is improved as a result of thoughtful, considered infrastructure development.

For too long, infrastructure has been designed for communities rather than with them. The examples in this report highlight the multitude of benefits that come with genuine community engagement. The voices of women, people with disabilities, Indigenous people, and all other marginalised groups can help to shape the decisions that affect their lives, informing and inspiring infrastructure practitioners to develop solutions that meet community needs while improving climate resilience.

This approach is not just a 'nice-to-have' – it can be life-saving, particularly in times of disaster. It ensures that everyone can access safe evacuation routes, that shelters are safe spaces that don't compound vulnerabilities, and that early warning systems reach everybody. Mainstreaming GEDSI considerations into infrastructure planning ensures that these fundamental, practical outcomes can be achieved.

Delivering on this vision requires building institutional capacity and forging strong partnerships across sectors. The private sector, governments, NGOs, and community organisations must work together to design and deliver infrastructure that reflects local contexts and uplifts both natural and social environments. By doing so, we can foster a culture of decision-making that is inclusive, informed, and responsive to the needs of all people in the face of a changing climate.

This approach aligns closely with both the Sharm El-Sheikh Adaptation Agenda and the Race to Resilience campaign, which call for people-centred, locally-led action that protects those most vulnerable to climate change.

By spotlighting real-world solutions, we hope to show what can be achieved when engineers build infrastructure that works for everyone; infrastructure that is equitable, sustainable, and resilient by design.

Savina Carluccio

Executive Director, International Coalition for Sustainable Infrastructure

GLOSSARY

ADA	Americans with Disabilities Act
AI	Artificial Intelligence
AT	Assistive Technology
ASEAN	Association of Southeast Asian Nations
CDRFI	Climate and Disaster Risk Finance and Insurance
DRI	Disaster Resilient Infrastructure
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EV	Electric Vehicle
EWS	Early Warning System
GBV	Gender-Based Violence
GEDSI	Gender Equality, Disability, and Social Inclusion
GeoAI	Geospatial Artificial Intelligence
INGO	International Non-Governmental Organisation
GHG	Greenhouse Gas
LED	Light-Emitting Diode
LCA	Lifecycle Assessment
KPI	Key Performance Indicator
MDB	Multilateral Development bank
NbS	Nature-based Solutions
NDCs	Nationally Determined Contributions
NGO	Non-Governmental Organisation
OPDs	Organisations of Persons with Disabilities
PPP	Public-Private Partnership
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
WASH	Water, Sanitation and Hygiene

