

# INCLUSIVE INFRASTRUCTURE FOR CLIMATE ACTION



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# Abbreviations

**ADA**

Americans with Disabilities Act of 1990

**CBM**

Christian Blind Mission

**COP**

Conference of the Parties

**CRVA**

Climate risk and vulnerability assessment

**CSO**

Civil society organization

**GBV**

Gender-based violence

**GDP**

Gross domestic product

**GIH**

Global Infrastructure Hub

**GlaSS**

Glasgow-Sharm el-Sheikh work programme on the Global Goal on Adaptation

**IDP(s)**

Internally displaced person(s)

**INGO(s)**

International non-governmental organization(s)

**IPCC**

Intergovernmental Panel on Climate Change

**MIUSA**

Mobility International USA

**NGO**

Non-governmental organization

**OECD**

Organisation for Economic Co-operation and Development

**PWD(s)**

Person(s) with disabilities

**SDG(s)**

Sustainable Development Goal(s)

**SEA**

Strategic Environmental Assessment

**SOGIESC**

Sexual orientation, gender identity, gender expression, and sex characteristics

**SRGBV**

School-related gender-based violence

**UDHR**

Universal Declaration of Human Rights

**UNOPS**

United Nations Office for Project Services

**UN Women**

United Nations Entity for Gender Equality and the Empowerment of Women

**WHO**

World Health Organization

## Foreword

Worldwide, there is a huge need to develop infrastructure required to support sustainable development. But as we work to mobilize the resources to meet this need, the fundamental question remains: how do we make sure that our infrastructure systems truly leave no one behind?

The answer lies in a focus on inclusion. Infrastructure can be – and often is – blind to the needs of its users, whether it is women, people with disabilities, older people, or other marginalized groups. The climate crisis further exposes the existing infrastructure inequalities, exposing already vulnerable groups further to climate risks. For example, in developing countries, women are more at risk of suffering or dying than men, due to limited access to information, lack of physical and sexual safety in public shelters, and limits to mobility. In sub-Saharan Africa, children living in rural areas are more at risk of diarrhoea, as changing weather patterns intensify the transmission of infectious diseases in areas with inadequate water and sanitation systems.

This needs to change. To be truly inclusive, the design and implementation of infrastructure should take into account the diverse needs of everyone, especially the most marginalized. The concept of Universal Design – to make infrastructure, environments and products cater to all users with diverse needs to the greatest extent possible – provides a helpful guide here. When infrastructure is inclusive, it empowers all people to have a good quality of life, fully participate in society and be more resilient to climate change impacts.

This publication focuses on the importance of developing such an inclusive approach to infrastructure, while addressing the urgent issues of climate action. It calls for an approach that identifies and responds to marginalization, socio-economic inequalities and climate vulnerabilities, and their interdependent natures. Building on valuable insight gained from colleagues who work directly with women and marginalized communities across the world, it offers recommendations to develop infrastructure that is equitable, accessible, affordable and empowering, while respecting the “do no harm” principle.

Developing infrastructure that works for everyone is a long and painstaking journey, but one that the Sustainable Development Goals absolutely depend on. This publication is a positive step towards promoting infrastructure that leaves no one behind, for a better future for us all.



**Jens Wandel**  
UNOPS Acting Executive Director

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To investigate what inclusive infrastructure means in practice, we sought to gain perspectives from local communities through organizations that closely engage them. We interviewed 10 international non-governmental organizations working directly with communities in different parts of the world. We adopted this approach to better assess what infrastructure services are needed by marginalized groups for their day-to-day lives. Most importantly, we sought to understand how the climate crisis has affected them and impacted their access to infrastructure services.

We informed all participating INGOs of the nature and scope of the research and the intended publication of the results and solicited their consent to quote them.

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# Key terms

## Agency

The ability of a person and communities to act freely and make choices about their lives and what they deem important, which can be constrained by institutional structures, social barriers, and access to resources and power.<sup>1</sup>

## Adaptation limits

The point at which an actor's objectives or system needs cannot be secured from intolerable risks through adaptive actions to climate change. For hard adaptation limits, no adaptive actions are possible to avoid intolerable risks, while for soft adaptation limits, options may exist but are currently not available to avoid intolerable risks.<sup>2</sup>

## Capacity

The ability of people, organisations and society as a whole to manage their affairs successfully.<sup>3</sup> This can include individual capacities (e.g., skills, knowledge), organizational capacities (e.g., strategies, systems, processes), and enabling environment capacities (e.g., policy framework for economic, political, environmental and social factors).<sup>4</sup>

## Children

Persons under 18 years of age, as defined by The UN Convention on the Rights of the Child.<sup>5</sup>

## Climate-compatible infrastructure

Infrastructure that creates mutual benefits between climate risk management, climate mitigation, climate adaptation, and sustainable development strategies in order to achieve climate-compatible development.<sup>6,7</sup>

## Climate-compatible development

Development that minimizes the harm caused by climate impacts while maximizing the many human development opportunities presented by a low emissions, more resilient, future.<sup>8</sup>

## Climate-resilient infrastructure

Infrastructure that anticipates, prepares for, and adapts to changing climate conditions across the life cycle of infrastructure assets and systems, in order to withstand, respond to and recover rapidly from climate-induced disruptions.<sup>9</sup>

## Disaggregated data

Data that has been broken down into detailed subcategories, for example marginalized group, age, sex, gender, region or level of education. Disaggregated data can reveal deprivations and inequalities that may not be fully reflected in aggregated data.<sup>10</sup>

## Empowerment

The process of enabling people to exercise their agency successfully. This can include increasing a person's control over personal decisions,

their ability to make autonomous choices and influence household decisions, their ability to change aspects in their life, and their ability to collectively change things in their community.<sup>11</sup>

## **Gender**

Refers to the roles, behaviours, activities and attributes that a given society at a given time considers appropriate for men and women. In addition to the social attributes and opportunities associated with being male and female and the relationships between women and men and girls and boys, gender also refers to the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes. They are context/time-specific and changeable. Gender determines what is expected, allowed and valued in a woman or a man in a given context. In most societies there are differences and inequalities between women and men in responsibilities assigned, activities undertaken, access to and control over resources, as well as decision-making opportunities. Gender is part of the broader sociocultural context, as are other important criteria for sociocultural analysis, including class, race, poverty level, ethnic group, sexual orientation, age, etc.<sup>12</sup>

## **Inclusion (social inclusion)**

The process by which efforts are made to ensure equal opportunities so that everyone, regardless of their background, can achieve their full potential in life. Such efforts include a combination of top-down and bottom-up policies and actions that promote equal access to public services and enable citizens' participation in the decision-making processes that affect their lives.<sup>13</sup>

## **Indigenous people**

People with distinct social, economic or political systems including language, culture and beliefs who have a strong link to ancestral territories and surrounding natural resources. They often form non-dominant groups of society and have a historical continuity with precolonial and/or pre-settler societies.<sup>14</sup>

## **Infrastructure**

A key pillar of development. It is the set of fundamental facilities and systems that deliver essential services needed for our society to function, such as energy, transport, water, waste management, digital communications and more. It has three dimensions that work together to provide services that enable development benefits: the built environment, the enabling environment, and the natural environment.

## **Infrastructure development**

The process of planning, delivering and managing infrastructure across the infrastructure life cycle.

## **Internally displaced persons (IDPs)**

Persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized state border.<sup>15</sup>

## Intersectionality

The interconnected nature of social categorizations such as race, gender identity, sexual orientation, religion, ability and social class, which overlap to create interdependent systems of privilege, oppression, discrimination or disadvantage. Originally coined by critical race theorist Kimberlé Crenshaw.<sup>16</sup>

## LGBTIQ+

An acronym for lesbian, gay, bisexual, transgender, intersex, and queer people. The plus (+) sign represents people with diverse sexual orientations, gender identities, gender expressions, and/or sex characteristics (SOGIESC) who identify using other terms or none.<sup>17</sup> While the acronym is not universally employed by all people of diverse SOGIESC, it is the most common marker of diverse SOGIESC in contexts across the global South and North.

## Leave no one behind

The central, transformative promise of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals. It represents the unequivocal commitment of all UN Member States to eradicate poverty in all its forms, end discrimination and exclusion, and reduce the inequalities and vulnerabilities that leave people behind and undermine the potential of individuals and of humanity as a whole.<sup>18</sup>

## Marginalized groups

Groups and communities that experience discrimination and exclusion (social, political and economic) because of unequal power relationships across economic, political, social and cultural dimensions.<sup>19</sup>

Marginalized people can be excluded in a specific context on the basis of different personal characteristics or grounds, such as sex, gender, age, ethnicity, religion or belief, health status, disability, sexual orientation, gender identity, education, income, or living in various geographic localities. A person belonging to a marginalized group (whether actual or perceived) faces increased risk of inequalities in accessing rights and use of services and goods,<sup>20</sup> including essential infrastructure services.

## Older people

An older person is defined by the United Nations as a person who is over 60 years of age. However, families and communities often use other sociocultural referents to define age, including status in the family, physical appearance, or age-related health conditions.<sup>21</sup>

## Persons with disabilities (PWD)

Include those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.<sup>22</sup>

## People living in poverty

People living in a condition characterized by sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights.<sup>23</sup>

## Refugee

Under international law and UNHCR’s mandate, refugees are persons outside their countries of origin who are in need of international protection because of feared persecution, or a serious threat to their life, physical integrity or freedom in their country of origin as a result of persecution, armed conflict, violence or serious public disorder.<sup>24</sup>

## Social justice

The fair distribution of opportunities, rewards and responsibilities in society, as well as principles and institutions for the distribution of meaningful social goods – income, shelter, food, health, education, and the freedom to pursue individual goals.<sup>25</sup>

## Vulnerable

Social vulnerability refers to the varied capacity or inability of groups and individuals to deal with hazards and take effective measures to insure against losses. This is based on their physical and socio-economic position, control over resources, as well as exposure to, awareness of, management of and ability to respond to risk.<sup>26</sup>

## Youth

All persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States.<sup>27</sup>

## Icon guide

### Systemic barriers



Discrimination and social exclusion



Physical barriers and lack of safety



Prohibitive costs and requirements



Limited access to information



Lack of access to decision-making

### Infrastructure services



Climate compatibility



Energy



Waste management



Water and sanitation



Digital communications

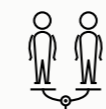


Transport



Buildings

### Inclusive infrastructure principles



Equitable



Accessible



Affordable



Do-no-harm



Empowering

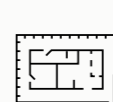
### Stakeholders



Government



Financiers



Project teams and specialists



Civil society and communities

# Executive summary

**Infrastructure development must be accelerated to address gaps, but this must be done through the right solutions and encompass more social needs.**

There is a huge gap in infrastructure development worldwide, with an estimated \$97 trillion of global infrastructure investment needed from 2016 to 2040 to address sustainable development needs.<sup>28</sup> This gap presents a critical opportunity to develop quality infrastructure that mainstreams sustainability, resilience and inclusion at all stages of the infrastructure systems life cycle.

Despite global commitments toward sustainable development that upholds the principle of leaving no one behind, stark inequalities remain among different people across the social dimensions of sex, gender, economic status, ethnicity, or legal status, among others. These inequalities manifest in the most marginalized populations being deprived of basic needs and essential services, leading to poor quality of life and a lack of resilience and adaptive capacity to cope with the challenges of our time. Lack of access to sustainable and resilient infrastructure leads to women and marginalized people being disproportionately impacted by the COVID-19 pandemic and the climate change crisis.

The climate change crisis is one of the most pressing challenges faced by humanity, and current global efforts are inadequate to prevent the worsening of climate impacts in the 21st century. The

Intergovernmental Panel on Climate Change (IPCC) 2022 assessment on the state of climate change finds that rapid acceleration of climate action efforts is necessary to protect all life on Earth, which can be enabled through inclusive and equitable development choices while transitioning our societies towards climate resilience. Inclusive approaches to climate action that are anchored in equity and human rights can be more socially-accepted, long-lasting, and effective in addressing the adaptation limits faced by marginalized communities. This was further highlighted at the 2021 United Nations Climate Change Conference (COP26), where countries committed to inclusive and rights-based climate action toward achieving the Global Goal on Adaptation.

The right infrastructure done well at the right time, and which places people and the planet at the heart of decision-making, is necessary to create lasting impact and build a more sustainable, resilient, and inclusive future for all people.<sup>29</sup>

**The path to building a sustainable future that leaves no one behind lies at the nexus of inclusion, climate compatibility, and infrastructure.**

Infrastructure provides essential services to people, enables the proper functioning of society, and protects people from risks such as climate-related hazards. It is critical in enabling inclusive development for all, as it influences the achievement of up to 88 per cent of the targets of the Sustainable Development Goals (SDGs) related to inclusive outcomes for women and marginalized groups, who constitute around 81 to 88 per cent of the global population.

Infrastructure is also a central aspect of climate-compatible development, where climate mitigation, adaptation, risk management, and sustainable development strategies<sup>30, 31</sup> are combined to minimize harm caused by climate impacts while maximizing opportunities for human development.<sup>32</sup> As infrastructure will take up around 35 to 60 per cent of the future carbon budget,<sup>33</sup> it must be developed to minimize emissions to achieve global targets. It must also be developed to improve the resilience and adaptive capacity of people and infrastructure systems themselves, which are at risk of damage and disruption if not adapted to changing climate conditions.<sup>34</sup>

The purpose of this publication is to promote the importance of an inclusive approach to infrastructure development that addresses urgent issues of climate action. This publication articulates this approach through principles and recommended action areas.

**Mainstreaming inclusion in climate-compatible infrastructure requires an intersectional approach to vulnerability.**

Through a literature review and key interviews with representative organizations, a gap was identified around inclusive infrastructure both across sectors and multiple needs of social groups. While there is rhetoric around the need for climate action to address the needs of the most vulnerable, there is limited discourse around what that means in practice.

Inclusive infrastructure is defined here as infrastructure development that takes into account the diverse needs of everyone, especially the most marginalized, and empowers all peoples to have a good quality of life, be able to fully participate in society, and be more resilient to climate change impacts.

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. While it is difficult to measure, we estimate that women and the marginalized are by far the majority of users, making up more than 80 per cent of the population. Their needs and the ways current infrastructure solutions fail to address them are as diverse as the people themselves.

Informed by the diverse knowledge of 10 international non-governmental organizations working directly with women and marginalized groups worldwide, this publication explores the intersectional experiences of 9 diverse groups with respect to the advantages and disadvantages they face in accessing infrastructure services and building resilience against climate change. It gives an overview of the experiences of (1) children, (2) youth, (3) older people, (4) persons with disabilities, (5) women and girls, (6) LGBTIQ+ people, (7) indigenous people, (8) refugees and internally displaced people, and (9) people living in poverty. These profiles highlight their diverse needs for climate-compatible infrastructure, energy, transport, water and sanitation, waste management, digital communications, and buildings, showing that there is no one-size-fits-all approach to inclusive infrastructure development.

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. This intersectional perspective acknowledges that people are not inherently vulnerable due to their social identities, but that vulnerability is dynamic and

results from people living in vulnerable situations caused by social inequalities and systemic barriers.<sup>35</sup> For simplicity, we have grouped the systemic barriers faced by each social group according to five themes:

1. **Discrimination and social exclusion**, where people face social stigma and negative bias that limit their access to essential infrastructure services;
2. **Physical barriers and lack of safety**, where people cannot easily or safely access or use infrastructure services due to physiology, disability or risk of physical or sexual harm;
3. **Prohibitive costs and requirements**, where people cannot financially or legally access infrastructure services due to economic, legal or migrant status;
4. **Limited access to information**, where people do not have access to or are unable to understand information regarding climate change or infrastructure services; and
5. **Lack of access to decision-making**, where people lack agency and face power imbalances, and thus are unable to make decisions regarding their daily activities or physical environment.

To address these systemic barriers, five principles are set out to embody inclusive infrastructure. These principles lead to numerous benefits for marginalized people and communities as a whole, such as improved social justice, decent standards of living, adaptive capacity against hazards, higher level of agency, sense of dignity and freedom of choice, as well as reduced poverty and increased macroeconomic growth, among others. As a result, socio-economic vulnerabilities and exposure to negative climate impacts are reduced and sustainable

choices are made more accessible, leading to improved resilience and adaptive capacity to tackle climate change as well as improved demand-side mitigation. The five principles of inclusive infrastructure are:

1. **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;
2. **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;
3. **Affordable**: increases the opportunities for people of different economic means to access good quality, sustainable and resilient infrastructure services;
4. **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
5. **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.

Bringing these related but complex concepts together – inclusion, climate compatibility and infrastructure – is challenging but necessary if we are to optimally allocate limited resources to achieve sustainable development. To promote a cross-cutting, bottom-up, sustainable approach to achieving inclusion in the context of the climate crisis, input from the research has been synthesized into recommendations.



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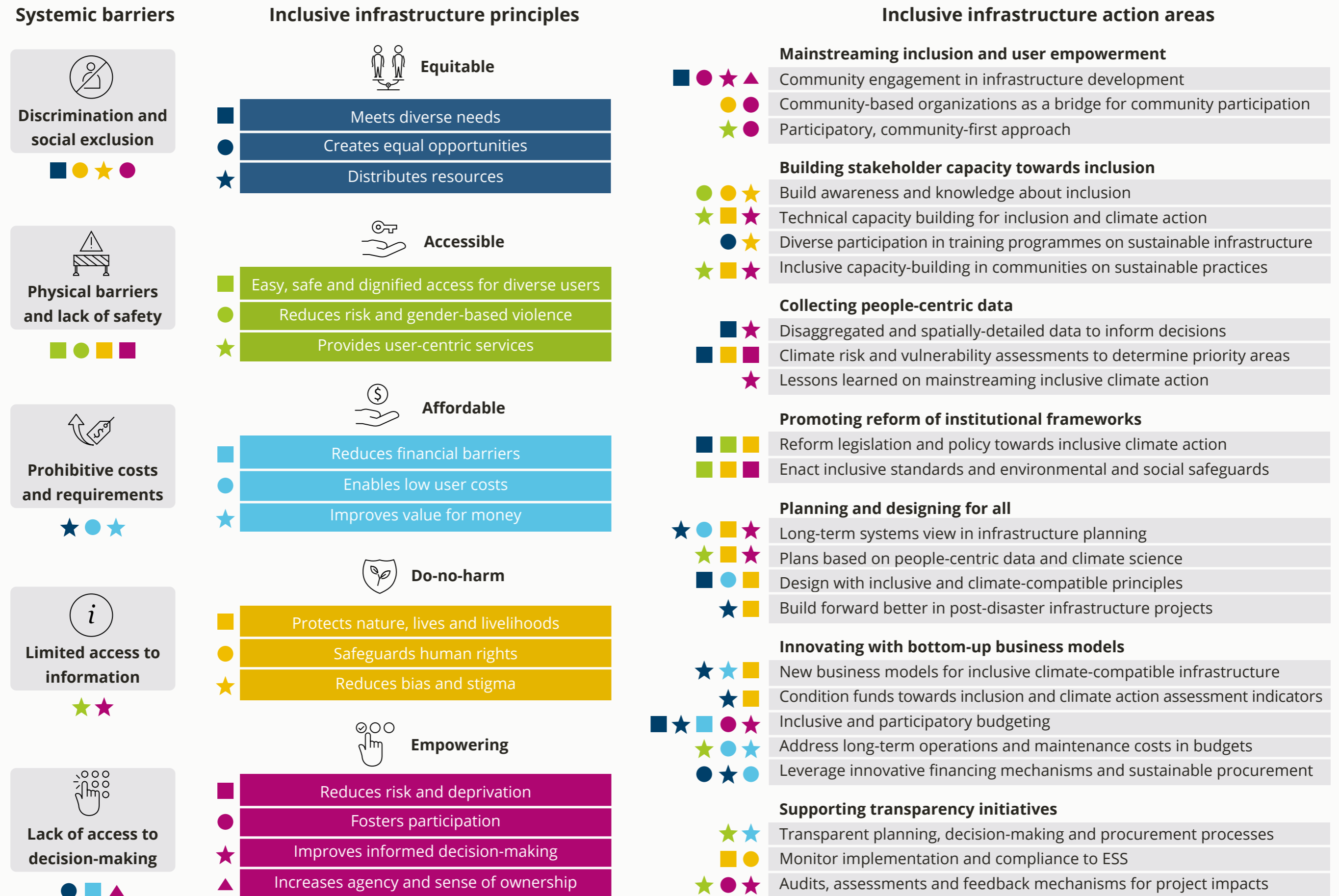
The recommendations are consolidated into action areas across infrastructure planning, delivery and management:

1. **Mainstreaming inclusion and user empowerment:** improving meaningful participation of women and marginalized groups in all stages of infrastructure development to ensure equitable outcomes;
2. **Building stakeholder capacity towards inclusion:** increasing technical capacity, awareness and sensitivity across all stakeholders to ensure inclusive infrastructure policies, processes and outcomes;
3. **Collecting people-centric data:** using disaggregated data and climate risk and vulnerability assessments to make informed decisions in infrastructure planning and delivery;
4. **Promoting reform of institutional frameworks:** improving governance for inclusive and climate-compatible infrastructure development;
5. **Planning and designing for all:** integrating inclusive and climate-compatible principles at every step, from national infrastructure planning down to project level;
6. **Innovating with bottom-up business models:** creating new business models and leveraging innovative finance mechanisms for inclusive and climate-compatible infrastructure; and
7. **Supporting transparency initiatives:** ensuring transparency and accountability in infrastructure development to ensure inclusive, climate-compatible outcomes.

Combined, these principles and action areas articulate an inclusive approach to climate-compatible infrastructure development.



**Figure 1. Mapping of inclusive infrastructure principles and action areas and the systemic barriers they can help alleviate**



# Section 1

## Introduction

**Despite progress towards sustainable development that upholds the principle of leaving no one behind, there is evidence that stark inequalities between peoples persist.** Global income inequality has remained high, with half of the global population earning less than 10 per cent of the total global income over the last century, and women making only 35 per cent of global labour incomes.<sup>36</sup> The COVID-19 pandemic has exposed inequitable access to healthcare services and healthy living environments, which increased the exposure to and severity of the virus for older people, people living in poverty, migrants and minorities.<sup>37</sup> The pandemic has also negatively affected efforts towards global gender parity: it will now take an estimated 132 years to close the gender gap between men and women across economic, educational, political and health factors,<sup>38</sup> an increase of 32 years from 2020 estimates. An Oxfam report<sup>39</sup> finds that inequality contributes to the death of one person every four seconds in relation to lack of access to quality healthcare services, gender-based violence (GBV), poverty-induced hunger and starvation, and the negative impacts of climate change in poor countries.

These pervasive inequalities show that more effort must be made to ensure an inclusive, sustainable and resilient future for people and the planet. However, as the COVID-19 pandemic has shown, there are contemporary challenges that threaten to undermine sustainable development gains that have already been made.



**One of the greatest threats to inclusive sustainable development is the climate change crisis.** Increasing climate change impacts lead to food and water insecurity, health issues, loss of livelihoods, displacement and damaged infrastructure,<sup>40</sup> which can exacerbate poverty, inequalities and marginalization. These negative impacts disproportionately affect women<sup>41</sup> and the most marginalized populations whose livelihoods are more dependent on natural resources, and who are also more exposed and less able to adapt to and recover from climate risks, resulting in a vicious cycle of increasing

vulnerability and inequality.<sup>42</sup> As a result, it is estimated that by 2030, up to 132 million people may fall into extreme poverty – in addition to those already living in similar conditions – due to climate change impacts.<sup>43</sup>

It is thus crucial to simultaneously address issues of inequality and climate change in order to achieve sustainable development that leaves no one behind.

## 1.1 An inclusive approach to climate action is necessary

**Climate change is one of the most pressing challenges of our time.**

Global warming above 1.5 degrees Celsius will increase devastating climate-related risks for humans and ecosystems, with the most marginalized populations at disproportionate risk despite being the least responsible for climate change.<sup>44</sup> The 2015 Paris Agreement on climate change marked the beginning of an ambitious global effort to combat dangerous climate change by limiting the rise of the global temperature to below 2 degrees Celsius, and preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

**However, current efforts to achieve global climate action targets are falling short.**

Despite international efforts, the IPCC Sixth Assessment Report 2022<sup>45</sup> finds that projected global emissions in 2030 based on nationally determined contributions announced prior to COP26 make it likely that global warming will exceed 1.5 degrees Celsius during the 21st century. A rapid acceleration of mitigation

efforts after 2030 is necessary to limit warming to below 2 degrees Celsius and protect life on Earth, especially the most vulnerable peoples, communities and ecosystems.

**Making inclusive, equitable, and just development choices while transitioning to more sustainable and climate-resilient societies can accelerate climate action for all.** Climate action anchored alongside societal aspirations and efforts towards sustainable development, equity and poverty reduction can be more acceptable, durable, feasible and effective in the applied contexts<sup>46</sup> and help address adaptation limits faced by marginalized people as a result of inequity and poverty.<sup>47</sup>

**International agreements at COP26 further highlight the need for inclusive and rights-based climate action.** The Glasgow-Sharm el-Sheikh work programme on the Global Goal on Adaptation (GlaSS) articulates that climate adaptation actions should “follow a country-driven, gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems”. It also states that:

“Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity.”

While the Global Goal on Adaptation is a key objective of the Paris Agreement, little progress has been made to define and operationalize it. Looking to COP27, where the GlaSS work programme will be further developed, it will be crucial to clarify what constitutes an inclusive approach to climate action, including and particularly in relation to sustainable infrastructure development.

## 1.2 The nexus of inclusion, climate compatibility and infrastructure: the path to a sustainable future that leaves no one behind

**Infrastructure provides essential services to people, enables the proper functioning of society, and protects people from risks such as climate-related hazards.** Our daily activities as a society are supported by infrastructure systems such as energy, transport, water and sanitation, waste management, and digital communications; meanwhile, other essential services such as housing, health, education and government are supported by infrastructure assets such as houses, hospitals, schools, community centres and government buildings. There are also man-made and nature-based infrastructure assets that provide protection to both people and nature, such as flood retention ponds, mangrove forests and urban parks, which can reduce the risk of flooding, tidal surges or extreme temperatures. In combination, infrastructure systems enable people to engage productively in society and build their socio-economic resilience against shocks and stresses, including climate change impacts.

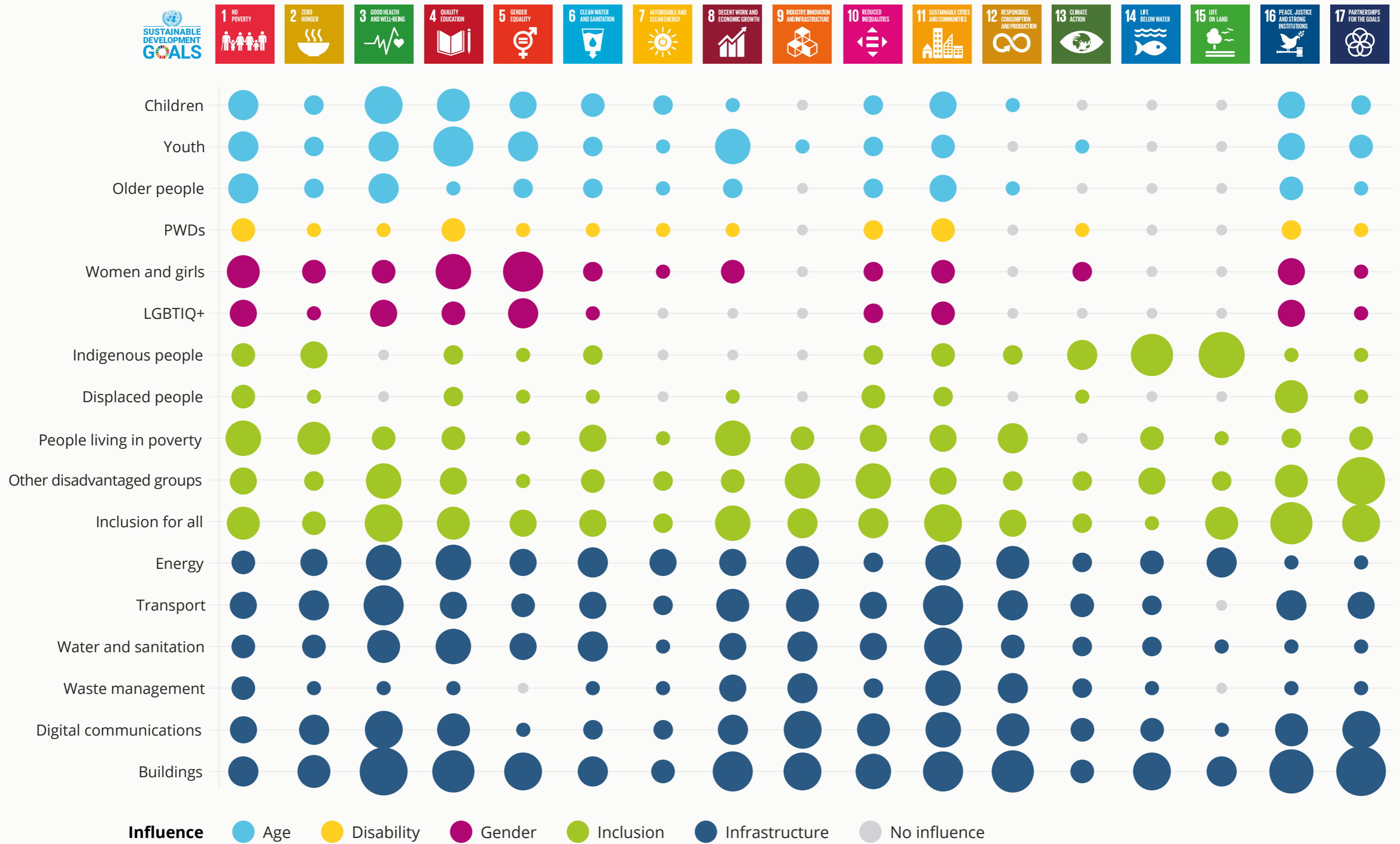
**There is still a huge global need to develop infrastructure, especially in developing countries.** The global infrastructure investment needed from 2016 to 2040 is estimated to be \$94 trillion, with an additional \$3 trillion needed to fulfill the SDG targets related to infrastructure.<sup>48</sup> Africa's infrastructure needs are estimated to range between \$130 billion to \$170 billion a year, with a financing gap of \$68 billion to \$108 billion.<sup>49</sup> In order to develop Asia as a whole, the Asian Development Bank estimated a financing gap of \$459 billion per year, or about 2.4 per cent of the region's gross domestic product (GDP), for economic infrastructure up to 2030. In Latin America and the Caribbean, infrastructure investment needs are estimated to be 3 to 8 per cent of the region's GDP, yet investments range between only 2 to 3 per cent.

**While addressing the infrastructure gap, it is critical to develop quality infrastructure that mainstreams sustainability, resilience and inclusion at all stages of the infrastructure systems life cycle, placing people and the planet at the heart of decision-making.** The right infrastructure done well at the right time is necessary to achieve global goals for climate action and sustainable development.<sup>50</sup>

**Infrastructure is key to enabling inclusive development that leaves no one behind.** Infrastructure influences up to 88 per cent of the targets of the SDGs that explicitly identify the need for inclusive development outcomes for different social groups (*see Figure 2*). In particular, Target 1.5 emphasizes the need for marginalized people to build resilience and reduce vulnerability to climate-related impacts, which is supported by all infrastructure sectors. Infrastructure is also key to achieving global commitments for gender equality and the empowerment of women and girls, such as the Convention on the Elimination of All Forms of Discrimination Against Women, the Beijing Declaration and Platform for Action, and by the Commission on the Status of Women.<sup>51</sup>

## Figure 2. Relationship between inclusive infrastructure, SDGs, and inclusive outcomes for diverse groups<sup>52</sup>

Different infrastructure sectors may influence the fulfilment of an SDG target, which in turn influences inclusive outcomes for different types of people.



Bubble size corresponds to the percentage of SDG targets related to the social group or infrastructure sector

**Infrastructure is also a central aspect of climate-compatible development.** Climate-compatible development combines climate mitigation, adaptation, risk management and sustainable development strategies<sup>53,54</sup> to minimize harm caused by climate impacts while maximizing opportunities for human development.<sup>55</sup> Infrastructure plays a key role, as it is responsible for 79 per cent of all greenhouse gas emissions, accounts for 88 per cent of all adaptation costs,<sup>56</sup> and will take up around 35 to 60 per cent of the future carbon budget.<sup>57</sup> On the other hand, key infrastructure systems such as water, sanitation, transport, communications, energy and health will be increasingly vulnerable if infrastructure design is not adapted for climate change.<sup>58</sup>

**Inclusive and climate-compatible infrastructure supports the right to an adequate standard of living, free participation in society, and access to a clean, healthy and sustainable environment.** These are underscored in the Universal Declaration of Human Rights (UDHR).<sup>59</sup> An inclusive approach to climate action in infrastructure development is critical to ensure that all types of people can have equitable access to a dignified standard of living and increased resilience and adaptive capacity to tackle climate change impacts.

### 1.3 Inclusive infrastructure empowers and protects the diverse many in the face of intensifying climate change

**Inclusive infrastructure takes into account the diverse needs of everyone and empowers all peoples, especially the most marginalized, to have a good quality of life, be able to fully participate in society, and be more resilient to climate change impacts.** It aims to

provide services and opportunities to people regardless of age, sex, sexual orientation, gender identity and expression, health or disability status, legal status, ethnicity, religion, education, income or geographical location.

**Inclusive infrastructure for climate action reduces the negative effects of climate change on those who are most vulnerable to it while equitably distributing the benefits and responsibilities of climate action.**<sup>60</sup> Inclusive infrastructure reduces exposure to negative climate impacts while also building adaptive capacity and resilience against unavoidable impacts. In the process of doing so, it ensures that the benefits are enjoyed by all types of people, and that the burdens are equitably distributed in communities and do not cause more harm.

For example, establishing a bus rapid transit network with electric buses can help improve mobility for all members of a community while also reducing greenhouse gas emissions and health issues associated with air pollution. However, this shift to a new transport system can jeopardize the employment of people working in the previous transport system, and the new system must be developed with consideration for women and girls' safety needs to ensure that they use it. An inclusive infrastructure approach will also plan for displaced workers to be trained and employed within the new transport system and will create opportunities to include regular, repeated multi-method training for workers on gender equality and women's safety needs, while also creating opportunities for more women to work in the transport sector.

**Inclusive infrastructure recognizes that diverse needs result from the intersectionality of people’s identities.** Every person has multiple dimensions of their social identity, some of which can change over time. The intersection of these identities results in unique experiences of advantages and disadvantages that are not additive<sup>61</sup> (for example, the experiences of an older woman cannot be understood by adding up the experiences of a young woman and an older man) and that are relative to the social context and can change from one context to another.

**By applying an intersectional approach, inclusive infrastructure identifies, examines and addresses the different barriers leading to inequities and exclusion for different people, especially the most marginalized.** This is done by using a gender-responsive and intersectional approach that highlights different needs and experiences to inform planning processes from the start. Further, an intersectional approach can reveal gaps in levels of agency, knowledge and skills, as well as in opportunities and the ability to participate in decision-making and have control over resources needed to achieve equitable outcomes. It is also important to investigate how laws, policies and programmes, resource allocations, and accountability mechanisms can enable or disable equality, as well as the impacts of social norms, attitudes and exclusionary practices.<sup>62</sup> One tool that can be useful for understanding inequality is gender-responsive budgeting. Understanding the roots of exclusion is key to promoting inclusion in infrastructure and climate action.

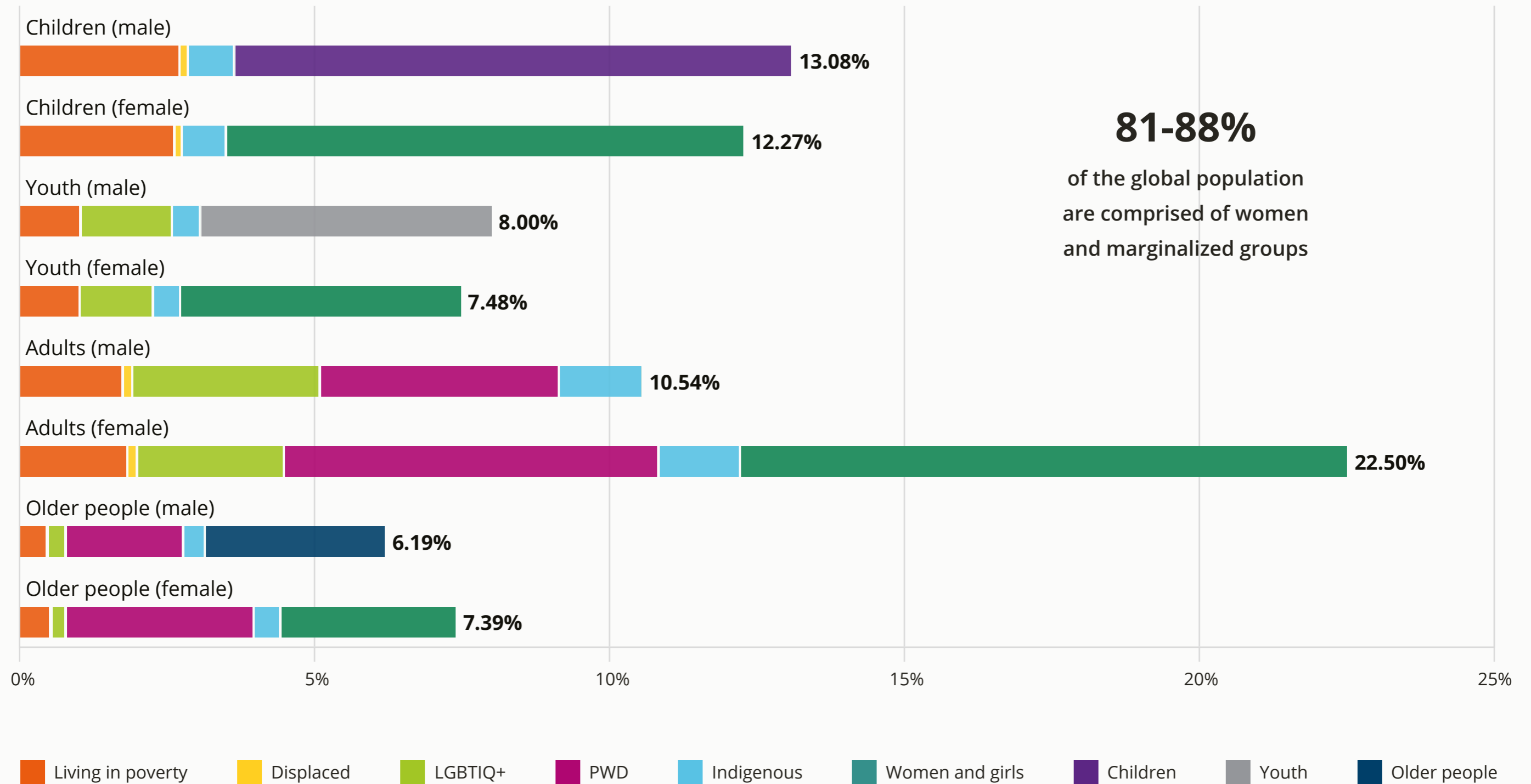
**Inclusive infrastructure does not just seek to address the needs of the minority, but of the diverse many – including addressing the needs of and barriers faced by 81 to 88 per cent of the global population.** Depending on their context, people can be marginalized on the basis of sex, gender, age, ethnicity, religion, health status,

disability, sexual orientation, education, income, or geographic location, among other factors. At some point in their lifetime, 81 to 88 per cent of the global population may belong to one or more social groups facing different levels of marginalization and exclusion from essential infrastructure services and decision-making processes (*see Figure 3*). This figure was derived by analyzing global statistics of different populations by age and gender, and further identifying specific subsets of marginalized populations such as persons with disabilities (PWDs), LGBTIQ+ people, people living in poverty, indigenous people, and displaced persons. These statistics were then aggregated to illustrate how critical it is to consider diverse needs when it comes to developing inclusive infrastructure for climate action.

Without addressing inequities within infrastructure for environmental, social and economic protection, there is a large risk that the lives of those already facing injustice and oppression will be made harder by the impacts of the climate crisis. Since non-inclusive infrastructure systems can only address the needs of around 12 to 19 per cent of the global population, inclusive infrastructure is necessary for the realization of universal human rights and other global agendas.

**As current global efforts focus on gaining momentum for climate mitigation and adaptation, it is essential to simultaneously address social inequities and ensure that climate action leaves no one behind.** This includes empowering women and marginalized people to be involved in informed decision-making processes, leveraging the knowledge of local and indigenous communities for climate action, and ensuring that diverse needs are met to improve climate resilience for all.

**Figure 3. Percentage of global population belonging to social groups facing different levels of marginalization and exclusion<sup>63, 64</sup>**





## 1.4 Methodology

An initial desktop review of infrastructure and inclusive development helped identify gaps in the literature and informed the classification of the marginalized groups to be investigated in this publication.

The findings on needs and barriers in this publication are informed by existing literature as well as the process of listening to and learning from the diverse knowledge and experiences of persons within marginalized communities across the world. Representatives from 10 international non-governmental organizations were consulted for this publication. They were consulted for this publication to give insight into the needs and experiences of diverse groups, the challenges they face, as well as the opportunities to develop inclusive infrastructure.

In the absence of an agreed definition of inclusive infrastructure, we have proposed five principles based on the findings. The research and interviews also informed the recommended action areas for promoting inclusive infrastructure.

## 1.5 Structure of the paper

**This publication proposes an inclusive approach to infrastructure that addresses urgent issues of climate action.** Inclusive infrastructure will be an important component of delivering climate action for all in the coming decades. This publication fills the gap<sup>65</sup> by providing a **definition of inclusive infrastructure** and **how it can be integrated with climate action** to achieve climate-compatible development. It takes an intersectional approach<sup>66</sup> in examining the

structural barriers interacting with dimensions of social identity that contribute to the non-inclusiveness of infrastructure.

The approach to inclusive infrastructure **goes beyond applying universal design principles**; it requires mainstreaming inclusive processes across the entire **life cycle of infrastructure development**.

This paper:

- Focuses on the social aspect of sustainable infrastructure to articulate the need for inclusive infrastructure in addressing issues of sustainable development and climate action.
- Recognizes the intersectionality of people's identities and experiences through the lens of nine different social groups.
- Is people-centric rather than infrastructure-centric; it focuses on the relationship between needs and services, particularly in the context of climate change.
- Emphasizes the role of inclusive infrastructure in the context of the climate crisis, highlighting the need to address socio-economic vulnerability and marginalization in order to build adaptive capacity and resilience against climate change for all.
- Identifies five key principles – equitable, accessible, affordable, do-no-harm, and empowering – which embody inclusive infrastructure.
- Sets out seven action areas – mainstreaming inclusion and user empowerment; building stakeholder capacity towards inclusion; collecting people-centric data; promoting reform of institutional frameworks; planning and designing for all; innovating with bottom-up business models; and supporting transparency

initiatives – with a total of 24 recommendations for delivering inclusive infrastructure for climate action.

In this first section, *Introduction*, we have set out the basis for inclusive infrastructure, its relationship to climate mitigation and adaptation, and why we need an approach that integrates both inclusion and climate action simultaneously.

Section 2, *Intersectionality and barriers to infrastructure in the context of climate change*, uses an intersectional approach to present the systemic barriers that create inequities in accessing infrastructure services for a diverse range of social groups. These barriers include discrimination and social exclusion, physical barriers and lack of safety, prohibitive costs and requirements, limited access to information, and lack of access to decision-making. The section presents the diverse experiences of nine social groups in relation to these barriers: children, youths, older people, persons with disabilities, women and girls, LGBTIQ+ people, indigenous people, refugees and internally displaced people, and people living in poverty. It provides examples of how systemic barriers can manifest for different groups and exacerbate climate impacts, and also discusses how inclusive infrastructure can empower different types of people and help build adaptive capacity and resilience.

Section 3, *Principles of an inclusive approach to infrastructure development*, describes five key principles of inclusive infrastructure – equitable, accessible, affordable, do-no-harm, and empowering – that respond to the barriers, disadvantages, and needs identified in Section 2. It also illustrates the outcomes of non-inclusive and inclusive approaches to infrastructure development based on statistics and

case studies. This is done to clearly define what inclusive infrastructure looks like in relation to its impacts on diverse groups and marginalized people.

Section 4, *Recommendations for developing inclusive infrastructure for climate action*, consolidates the findings from the research into seven action areas. Each area outlines opportunities and approaches to operationalize and develop inclusive infrastructure that addresses global agendas for sustainable development, human rights, and climate action for all. They were synthesized from lessons learned from interviewees, case studies and recommended practices. The roles of different stakeholders are also discussed to highlight the importance of inclusive processes.

Finally, this paper provides a platform for discourse and practical responses surrounding inclusive infrastructure, including a possible measurement framework based on the five key characteristics, and guidance for planning, design and implementation.

## Section 2

# Intersectionality and barriers to infrastructure in the context of climate change

**Developing inclusive infrastructure involves an intersectional approach to understanding where exclusion occurs and how it manifests for different types of people.** This is anchored in the social and environmental context, so it is important to listen to the situated experiences of people to reveal systemic inequities impacting different social identities. These inequities include barriers to essential and protective infrastructure services, leading to increased vulnerability to shocks and stresses such as abuse, social exclusion, natural hazards and climate change.

**In the context of climate change, inclusive infrastructure recognizes the need to improve resilience for all people.** Resilience refers to the capacity to adapt to, cope with, and recover from shocks and stresses, including climate change. Climate change has a disproportionate impact on women and marginalized groups because they are more exposed to climate-related risks and have reduced ability and means to cope with the negative impacts. Inclusive infrastructure addresses conditions of exclusion causing vulnerability and improves adaptative capacity and resilience against climate change impacts for all peoples. Aside from improving resilience, inclusive infrastructure also addresses equitable climate mitigation in order to achieve climate-compatible development.



Climate change exacerbates coastal erosion and storm surges in coastal cities like Saint-Louis, Senegal. © UNOPS/Aldi Diassé

## 2.1 Critical necessity of climate-compatible infrastructure for all

“Climate-resilient infrastructure should be considered as a critical need – and a growing need – as climate issues get worse and worse. It’s a matter of prioritization – focusing on people and a service approach, as opposed to infrastructure for economy, which is important but leads to a car-centric, people-adverse planning and design that we’re aiming to step away from.”

Gavin White, Executive Officer for the Climate Change and Resilience Committee, World Urban Parks

The ongoing climate crisis adversely affects the entire global population, cutting across geographic regions, gender, races, and socio-economic classes. All individuals should have access to resilient infrastructure services that can help them adapt to, prepare for, respond to, and recover from climate risks and sustain essential services during and after climate events. However, some groups are disproportionately exposed to climate risks and more susceptible to related damages, and consequently, suffer more from the negative impacts of climate change. To illustrate:

- In developing countries, women are more likely to die in disasters than men. Women in Bangladesh and Indonesia are two to five times more likely to die than men in tsunamis and cyclones, mainly due to differences between men and women in physiology, access to information about evacuation, and sociocultural gender norms.<sup>67</sup> These factors affect their ability to self-evacuate.

- In sub-Saharan Africa, changing weather patterns are intensifying the transmission of infectious diseases, leading to higher diarrhoea incidence rates among children living in rural areas with inadequate water and sanitation systems.<sup>68</sup>
- In the United States of America, American Indian and Alaska Native individuals are 48 per cent more likely than non-indigenous people to live in areas where land is projected to be inundated by sea level rise.<sup>69</sup>
- Approximately 1 billion people around the world live in informal settlements, which are typically at high risk of flooding and landslides due to a combination of risk-prone locations and poor quality or lack of protective infrastructure.<sup>70</sup>

“I have some friends and colleagues with disabilities who were stranded during disasters such as floods, when there was no electrical supply. Since they were using electrical wheelchairs, they were completely immobile during the disaster.”

Shivani Gupta, Technical Advisor for Inclusion, Christian Blind Mission (CBM)

**Marginalized groups face exclusion in their exercise of human rights in the form of physical, social, economic or legal inequities, which are exacerbated by climate change.**<sup>71</sup> Inequity increases exposure to climate hazards, worsens susceptibility to climate-related damages, and limits the capacity to cope with and recover from such damages. This results in disproportionate impacts to marginalized people through loss of assets and livelihood, causing further inequity and perpetuating a vicious cycle of growing socio-economic and climate vulnerability.

For example, people living in poverty in rural Bangladesh are highly affected by riverbank erosion caused by climate events, which leads to loss of land and livelihoods. They often move to cities like Dhaka to find a new place to live; however, due to economic barriers, they can only find places in informal settlements in precarious areas, with limited access to essential services.

“After disasters or climate events, it becomes very difficult for people living in poverty to live in low-lying areas which are vulnerable to floods or riverbank erosion. Most of the time they lose their land, making it impossible to continue living there. It becomes a push factor for them to move to big cities, but when they get there, it is easier for them to live in the slum areas where they can easily get jobs in rickshaw pulling. But even as they try to escape the uncertainty caused by climate change, they still suffer from uncertain and poor housing conditions in the big cities.”

Abu Sadat Moniruzzaman Khan, Climate Change Programme Head, BRAC

**Infrastructure development that does not address existing systems of exclusion and discrimination can serve to exacerbate vulnerability and increase inequalities.** Non-inclusive infrastructure development can result in refugee women and LGBTIQ+ people being at risk of GBV when travelling to outdoor latrines, children and the elderly being at risk of disease from improperly managed waste in informal settlements, and PWDs being at risk of unemployment due to difficulties navigating the physical environment and inaccessible transport options, to name a few examples. These conditions create

further vulnerability for marginalized people by compromising their health, safety, livelihood opportunities, and overall quality of life.

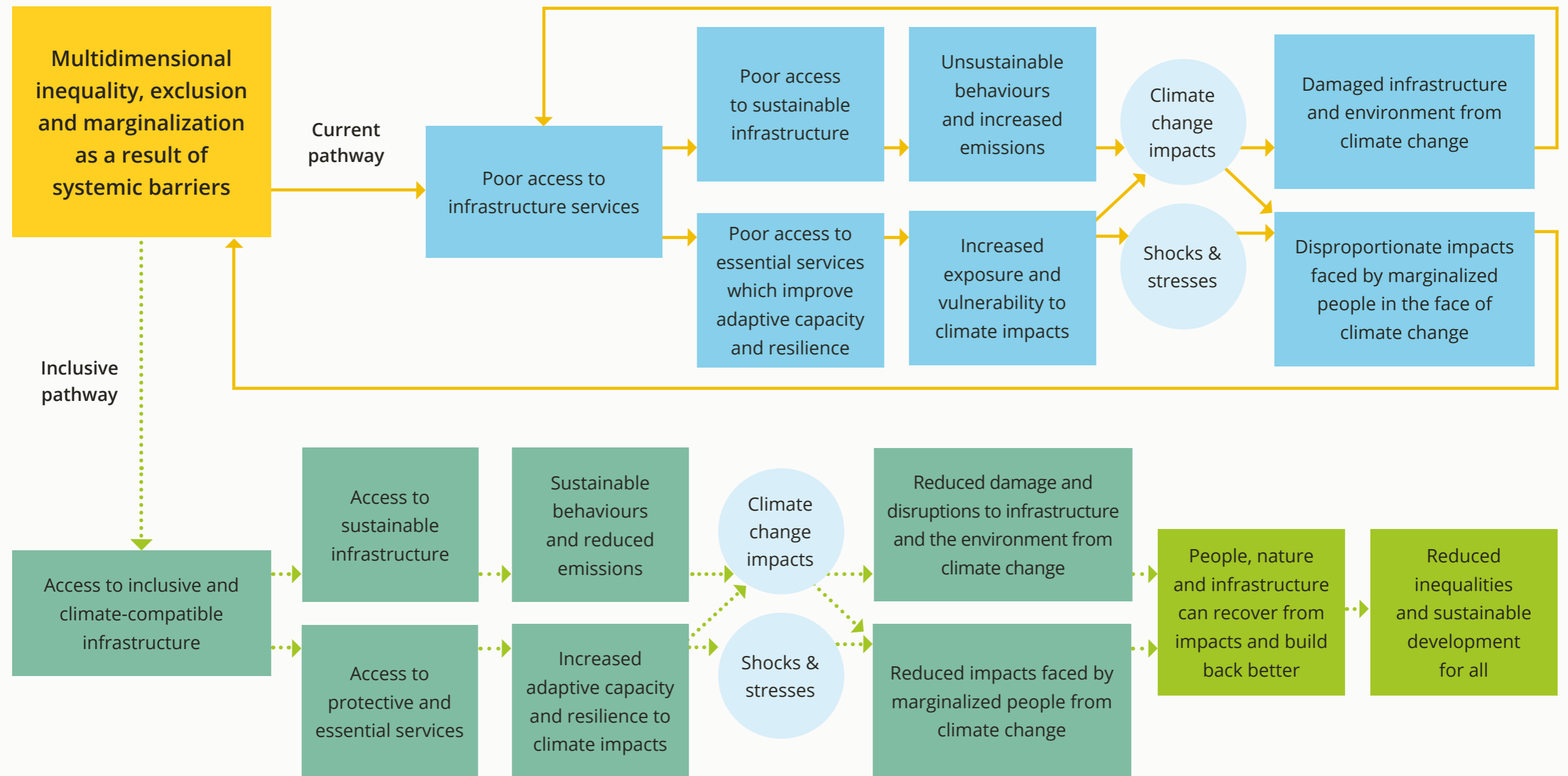
**Inclusive infrastructure for climate action can help break the cycle of marginalization in relation to climate change impacts.**

Poor access to infrastructure services means that marginalized communities may live in unsafe environments, suffer from poor health, have limited finances, and lack information about climate hazards. These all contribute to increased exposure and limited adaptive capacity and resilience against climate change impacts. Further, poor access to sustainable infrastructure for all people leads to unsustainable behaviours such as use of fossil fuels for cooking and transport, which contributes to increased greenhouse gas emissions. In combination, climate change impacts increase marginalization for communities and damage both infrastructure systems and the environment. Inclusive and climate-compatible infrastructure can help break this cycle by increasing resilience and mitigating dangerous climate change, thus helping people, nature and infrastructure to better recover from climate impacts and build back better for sustainable development (see Figure 4).

**Marginalized people are disproportionately impacted by climate change despite being the least responsible for greenhouse gas emissions; therefore climate-compatible infrastructure must be inclusive on a societal scale (see Table 1).**

Inclusive and climate-compatible infrastructure should provide essential services to everyone. Equitable distribution can build adaptive capacity and resilience to socio-economic and climate-related shocks and stresses while also improving universal access to sustainable and resilient infrastructure. This in turn minimizes greenhouse gas emissions and ensures that infrastructure systems remain fit for purpose.

**Figure 4. The role of inclusive and climate-compatible infrastructure development in breaking the cycle of marginalization and vulnerability to climate change impacts**



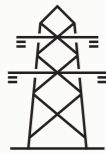

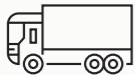



**Table 1. Climate-compatible infrastructure services for all<sup>72</sup>**

**CLIMATE-COMPATIBLE INFRASTRUCTURE SERVICES FOR ALL:**

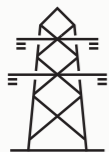




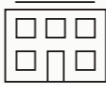
Climate-compatible infrastructure creates mutual benefits in climate risk management, climate mitigation, climate adaptation, and sustainable development strategies in order to minimize the harm caused by climate impacts while maximizing inclusive development opportunities presented by a low emissions, more resilient future.<sup>73</sup>

- Nature-based solutions can provide both mitigation (carbon sequestration) and adaptation benefits (slope stabilization, coastal protection).
- Funding, financial incentives and subsidies are important for both mitigation and adaptation strategies.
- Maintenance of infrastructure assets supports mitigation (fewer emissions from new construction) and adaptation (ensures effective response to hazards).
- Damaged structures and systems should be reconstructed to improve sustainability, inclusion and resilience for people and ecosystems.

**Inclusive mitigation:** Enabling the reduction of greenhouse gas emissions across society to mitigate dangerous climate change

 <p><b>Energy</b></p> <ul style="list-style-type: none"> <li>• Improve access to renewable and clean energy sources, and energy-efficient systems</li> <li>• Enable energy circularity</li> </ul>	 <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• Reduce waste production through reduced material production and consumption</li> <li>• Improve systems for recycling, reuse, composting and e-waste management</li> <li>• Convert waste to energy</li> </ul>
 <p><b>Transport</b></p> <ul style="list-style-type: none"> <li>• Increase access to low-carbon mobility options and mass transit</li> <li>• Use recycled construction materials for roads</li> </ul>	 <p><b>Digital communications</b></p> <ul style="list-style-type: none"> <li>• Enable longer life spans of materials and products</li> <li>• Improve access to digital green finance and promote e-procurement</li> </ul>
 <p><b>Water and sanitation</b></p> <ul style="list-style-type: none"> <li>• Improve access to water-efficient systems and plumbing fixtures</li> <li>• Enable circular systems and nature-based solutions for water, energy and food</li> </ul>	 <p><b>Buildings</b></p> <ul style="list-style-type: none"> <li>• Improve access to low-carbon and prefabricated construction materials</li> <li>• Institutionalize carbon-neutral buildings</li> </ul>

**Inclusive adaptation and risk management:** Improve resilience of infrastructure systems and adaptive capacity across society to cope with climate shocks and stresses

 <p><b>Energy</b></p> <ul style="list-style-type: none"> <li>• Improve access to affordable and sustainable emergency power supply</li> <li>• Ensure redundant power supply sources and protection of power production and distribution</li> </ul>	 <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• Enforce special management of infectious medical waste to avoid outbreaks</li> <li>• Ensure safely managed collection and clean-up of debris</li> <li>• Recycle debris as construction materials</li> </ul>
 <p><b>Transport</b></p> <ul style="list-style-type: none"> <li>• Ensure access to multiple modes of transport for diverse users</li> <li>• Protect routes from flooding</li> <li>• Enable safe and reliable transport systems that can support evacuation and emergency response</li> <li>• Enable systems for emergency search and rescue and mobile medical care</li> </ul>	 <p><b>Digital communications</b></p> <ul style="list-style-type: none"> <li>• Establish alternative communication systems for diverse users, including early warning systems</li> <li>• Improve access to training, education and information dissemination on climate change and emergency responses for diverse users</li> <li>• Enable accessible, real-time information dissemination</li> </ul>
 <p><b>Water and sanitation</b></p> <ul style="list-style-type: none"> <li>• Establish nature-based flood protection and rehabilitate drainage systems to limit floods and pollution run-off</li> <li>• Rehabilitate water and sanitation facilities to reduce infectious diseases</li> <li>• Rehabilitate water sources and water recycling systems for droughts</li> <li>• Ensure redundant system design, emergency water supply and firefighting systems</li> </ul>	 <p><b>Buildings</b></p> <ul style="list-style-type: none"> <li>• Institutionalize affordable structures designed to withstand extreme heat, strong winds and excessive rainfall</li> <li>• Rehabilitate medical facilities for resilience</li> <li>• Establish non-discriminatory emergency operations centres, evacuation shelters and mass care facilities</li> <li>• Require equitable and participatory relocation of displaced populations to safe sites with essential services</li> </ul>



**In order for these climate-compatible infrastructure services to be inclusive, diverse needs must be considered.** For example, infrastructure that supports temporary evacuation should address multiple considerations, such as:

- Illiterate people and people with visual, auditory or cognitive disabilities need appropriate methods of receiving information about evacuation through early warning systems.
- Older people, small children and people with reduced mobility need services that will ease their movement during evacuation.
- Women, children and LGBTIQ+ people need safe and gender-responsive sanitation facilities. Lactating mothers also need designated spaces in large-scale evacuation facilities.
- People living in poverty in rural areas may need space for livestock in evacuation facilities.

Ensuring that infrastructure is climate-compatible for all thus requires an intersectional understanding of people's diverse needs and the barriers they face. Inclusive and climate-compatible infrastructure addresses both socio-economic and climate-related vulnerability simultaneously. This is explored in the following section.

**“The assets of people living in poverty are mainly physical, including their homes and livestock to support their livelihoods. So it is very difficult for them to go to cyclone shelters more than 2 km away, taking their cows and goats, while also carrying their children and important assets. From that aspect, climate change programmes need to take into account both an inclusive principle and a climate principle.”**

**Abu Sadat Moniruzzaman Khan, Climate Change Programme Head, BRAC**

## 2.2 Diverse needs are intersectional

**“If somebody is both a person with disabilities and female, the situation is worse. If the person is male, their family will at least try to send them to school. But if the person is female, they will say there is no need for schooling, so that she can help out at home and do the housework. They are given less benefits and services, so their vulnerability increases because of their intersectional needs.”**

**Maria Huq, Director of Human Resource, BRAC**

Inclusive infrastructure addresses both socio-economic and climate-related vulnerabilities in order to ensure that all people can benefit from sustainable development in the context of climate change. However, some people experience greater vulnerability due to intersecting aspects of their social identity such as sex, gender, age, race, ethnicity or economic status. To illustrate:

- In Capetown, women and children living in poverty in informal settlements often lack access to toilets in their own homes. They are at increased risk of physical and sexual violence when going to outdoor toilets at night.<sup>74</sup>
- In Central America and the Andean Region, older people who are displaced due to conflict or disasters face the risk of homelessness and poor living conditions. This may be due to abandonment, isolation, impaired mobility or a lack of resources to return home. They face difficulty accessing services due to xenophobic discrimination or a lack of financial resources.<sup>75</sup>

- Some refugees who are also members of the LGBTIQ+ community face both racism and homophobia in the workplace and housing market. They are often forced to accept expensive but poor-quality housing where they are at risk of sexual exploitation and abuse by landlords.<sup>76</sup>

To develop inclusive infrastructure, an **intersectional perspective** is important because it recognizes that vulnerability is a result of several social variables interacting with social practices, institutional arrangements and cultural ideologies.<sup>77</sup> This means that people are not born vulnerable due to their social identities, but are made vulnerable by social inequalities and systemic barriers. Conversely, this also means that marginalized people can be empowered by addressing such inequalities and barriers. An intersectional perspective acknowledges that people have multiple facets to their social identities that interact with social inequalities and systemic barriers, affecting their access to sustainable, resilient and inclusive infrastructure.

**Inclusive infrastructure addresses systemic barriers and inequities to empower all people to have a good quality of life, fully participate in society and be resilient to climate change.**

Synthesized from the interview findings, the following barriers were identified to be faced by women and marginalized groups in accessing infrastructure services:



**Discrimination and social exclusion**

Women, girls and LGBTIQ+ people may face social or legal exclusion and harassment on the basis of gender and/or

sexual orientation. PWDs, refugees, internally displaced persons (IDPs) and indigenous people can also experience discrimination due to being perceived as “different”. For example, they can be barred from entering some public facilities because of social norms.



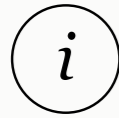
**Physical barriers and lack of safety**

The physical stature and condition of people with motor disabilities, older people, small children and pregnant women can make it difficult for them to use infrastructure services like other people do. For example, climbing a steep staircase to enter a building may be extremely taxing or physically impossible without assistance. Further, lack of safety can also be a physical deterrent to people using infrastructure services. For example, a badly lit bus stop may be a hotspot for crime, discouraging some people from using public transport.



**Prohibitive costs and requirements**

People living in poverty, refugees, IDPs and indigenous people may lack the financial resources and legal instruments needed to access adequate, safe, sustainable or formal infrastructure services. For example, a formal electricity connection can be impossible to secure without legal tenure to a home.



### Limited access to information

PWDs can have different communication requirements to access and understand information related to infrastructure services, such as braille or audio prompts for visually impaired people. Various groups can also be prevented from receiving information due to social exclusion, language barriers or lack of digital access. For example, evacuation alerts disseminated by mobile text messages in one language can be inaccessible to people with reading impairments, as well as refugees who don't know the language or don't have a mobile phone number registered to the alert system.



### Lack of access to decision-making

Children, youth and older people can be excluded from decision-making based on their age, and women may be excluded in some cases where discriminatory practices, cultural norms and patriarchal values discourage them from participating.<sup>78</sup> Various other groups can be excluded due to sociocultural norms or lack of participatory processes. For example, organizers of a public consultation for a new community centre may invite only male working-age heads of households without disabilities as participants.

**All peoples need access to inclusive infrastructure that is also climate-compatible. This includes energy, transport, water and sanitation, waste management, and digital communications infrastructure, as well as buildings that support essential services.**

Due to the intersectional nature of marginalized people's identities, there are nuances to how infrastructure can be inclusive for all.

The following subsections explore the diverse infrastructure service needs of the different social groups. This is done by highlighting the barriers and inequities faced by the social group, resulting in vulnerability; how this might be exacerbated in intersection with other aspects of social identity; how climate change can impact existing vulnerabilities; and the opportunities to empower different types of people through inclusive infrastructure. The needs of each group are mapped onto the six infrastructure sectors alongside climate-related needs across sectors. These profiles are not exhaustive, nor do they intend to reduce people's intersectional experiences to their membership in a social group. Rather, these profiles portray how different facets of social identity – such as age (children, youth, older people), health and disability (older people and PWDs), gender (women and girls, LGBTIQ+ people), as well as indigeneity, nationality, legal and socio-economic status (indigenous people, refugees & IDPs, people living in poverty, other groups) – can affect a person's infrastructure needs.



## 2.2.1 Children

Persons under 18 years of age.

“In many countries, such as Malawi where secondary schools are very few, children have to walk many hours to access school and are at risk of getting attacked on the way. In addition, they are expected to support their families at harvest time, which affects their attendance and ability to remain in school.”

Liz Palmer, Global Construction Lead, Save the Children International

### Barriers faced

 <p>Physical barriers and lack of safety</p>	<p>Children’s physiology and developmental needs vary greatly from birth to adolescence, and this affects how they safely interact with the built environment. In a climate emergency, children may have difficulties self-evacuating due to physical constraints (e.g., doors that are hard to open) or cognitive limitations (e.g., difficulty assessing the situation).</p>
 <p>Lack of access to decision-making</p>	<p>Children lack the power and cognitive ability to make decisions regarding their physical environments and living conditions, and so are generally dependent on adults and caregivers in their daily lives. Younger children are more dependent because of their cognitive and motor limitations. Older children, especially girls, are frequently asked to be caregivers for younger siblings and older family members, which affects their access to education and development.</p>



Limited access to information

Children may lack access or the cognitive ability to understand information about risks related to health, climate change, and physical and sexual safety.

### Some intersectional considerations

- Pre-adolescent girls need access to adequate sanitation facilities within schools for menstrual hygiene to encourage school attendance.
- School-related gender-based violence (SRGBV) affects boys and girls differently, with boys at more risk of physical bullying and violence and girls at more risk of sexual violence, harassment and exploitation.<sup>79</sup> SRGBV can occur both in schools (toilets, classrooms and corridors) and online.

### Empowering children

Inclusive infrastructure for children or child-friendly infrastructure recognizes that their physiologies and cognitive abilities are not the same as those of adults, thus different standards for anthropometric measurements and sensory inputs should be considered in designing infrastructure for children. This also means designing with the needs of their caregivers in mind. Further, children’s long-term development and health rely on clean and safe environments, which they have little to no agency to control. Therefore, inclusive infrastructure for children should promote good hygiene and sanitation to reduce the spread of vector-borne and waterborne diseases among children, ensure that non-motorized transport infrastructure is physically safe for children, and ensure that school-related digital systems and buildings are designed to withstand extreme climatic conditions and climate change-exacerbated disasters.

## Climate impacts

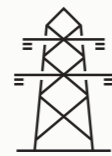
Children are highly affected by unsafe living environments, which can be exacerbated by climate change. For example, the WHO indicates that yearly, 1.7 million children under five years lose their lives because of preventable diseases such as diarrhoea, malaria and pneumonia. These diseases result from indoor and outdoor air pollution, second-hand smoke, unsafe water, lack of sanitation, and inadequate hygiene.<sup>80</sup> Schools being used as community evacuation centres during disasters caused by natural hazards can interrupt education.

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF CHILDREN



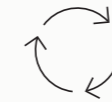
### Climate compatibility

- Safe outdoor areas that are sheltered from extreme weather conditions
- Clear and simple communications about evacuation procedures that children can easily follow
- Educational continuity after climate-related disruptions, e.g., remote learning or mobile classroom infrastructure
- Drought-resilient water systems



### Energy

- Reliable energy for online learning
- Clean cooking fuels to reduce health hazards



### Waste management

- Reducing child labour in informal waste picking and recycling



### Transport

- Child-friendly, safe and well-lit streets, bike lanes, designated crossings and paths, especially to schools and play areas<sup>81</sup>
- Access and space for baby strollers and caregivers in public transport



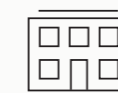
### Digital communications

- Affordable access to digital skills, devices and internet services to support online learning
- Design data recovery and backup digital infrastructure that prevents data loss at children's learning centres, specifically in the event of disasters



### Water and sanitation

- Improved hygiene and sanitation practices to prevent vector-borne diseases<sup>82</sup>
- Reduced standing water through improved drainage and waste water systems to mitigate the spread of waterborne disease among children
- Diaper changing stations in public toilets
- Menstrual hygiene management standards applied to public and secondary education toilets



### Buildings

- Child-friendly school design, including emergency exit design
- Reduced child labour in the production of construction materials
- Using renewable energy to power schools and children's recreational buildings

## 2.2.2 Youth

Persons between the ages of 15 and 24 years.

**“We have a large youth population across most of our 54 member states, including countries like Uganda that have 78 per cent of their population under 30. However, there is still a challenge of how to ensure that youth perspectives are mainstreamed into development thinking and planning. It is an ongoing challenge, in some countries more than others, particularly where there is a culture of not engaging young people this way.”**

**Layne Robinson, Head of Social Policy Development, Commonwealth Secretariat**



Prohibitive costs and requirements

Even when they reach the legal age of adulthood, young people’s agency may be limited by them not being financially independent yet. Young people are more likely to be negatively impacted by macroeconomic shocks than adult workers, as they are considered to be easier or ‘cheaper’ to fire than workers with longer tenure.<sup>86</sup> They are also more likely to work in temporary or informal employment with less economic protection.

### Barriers faced



Lack of access to decision-making

The youth generally lack access to decision-making processes regarding their social, economic or environmental conditions, and are thus at risk of impoverishment and social exclusion. As the global community becomes increasingly interconnected, their choices are affected by global issues of economic insecurity, technological change, political uprisings, and conflict.<sup>83</sup>



Discrimination and social exclusion

Young people may face social exclusion from their peers on the basis of individual characteristics or social identity, which can lead to negative effects on emotional and behavioural health, low self-esteem, academic difficulties and a decrease in prosocial behavior.<sup>84</sup> Social exclusion can also occur when young people are not digitally literate or connected to their peers online.<sup>85</sup>

### Some intersectional considerations

- LGBTIQ+ youth are at risk of poor mental health due to discrimination, harassment and exclusion.<sup>87</sup> Transgender youth also face hurdles in accessing unbiased healthcare and medical information.<sup>88</sup>
- Many girls and young women face GBV both offline and online. Social media harassment first occurs for many girls between the ages of 14 to 16.<sup>89</sup> This harassment can be worse when girls identify as LGBTIQ+, have a disability or belong to a racial minority group.

### Empowering youth

The youth can contribute to climate action and intergenerational sustainability as agents of change through activism, entrepreneurship and innovation. Inclusive infrastructure for the youth empowers them to access decision-making processes and spaces regarding their environments and opportunities to be self-sufficient.

## Climate impacts

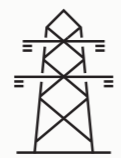
The youth are highly vulnerable to the long-term effects of climate change, which affects their future prospects regarding food security, economic opportunities and healthy living environments. They need infrastructure services that can support their ability to adapt to changes in industries adjusting to new technologies and sustainable systems. For example, digital skills are increasingly becoming a prerequisite to thriving in school and the job market, yet 63 per cent of youth lack internet access at home.<sup>90</sup> The youth are also impacted when transport and digital infrastructure systems are disrupted by climate change-related extreme weather, as they may face difficulties in accessing education, employment or social opportunities.

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF THE YOUTH



### Climate compatibility

- Gender-responsive public social spaces that are sheltered from extreme weather conditions
- Safe access, space and decision-making opportunities to engage in youth activism and action in climate justice
- Access to education about nature-based climate mitigation and adaptation
- Resilient systems for transport, energy and digital communications, which enable the youth to have access to education and employment after extreme weather events



### Energy

- Affordable energy for digital devices



### Digital communications

- Affordable access to digital skills and communications infrastructure for employment, education, public participation, information, mental health services and social connection



### Transport

- Affordable and safe transport options to access education and employment
- Safe streets and designated pedestrian crossings<sup>91</sup>



### Water and sanitation

- Adequate facilities for menstrual hygiene in schools and public toilets



### Buildings

- Safe, gender-positive school environment
- Gender-responsive training centres to improve employability
- Gender-responsive reproductive health and mental healthcare services



### 2.2.3 Older people

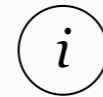
Persons who are over 60 years of age. However, families and communities often use other sociocultural referents to define age, including status in the family, physical appearance or age-related health conditions.<sup>92</sup>

**“There’s a huge gap in the data we collect. We may collect data on older people in general, but we forget about the issues of intersectionality: an older woman, an older man, an older woman with disability, an older man with chronic health conditions – no two older people are the same. In addition, the cost of living of people who are 60 to 69, 70 to 79, or 80+ are very different, so we cannot have a blanket approach to making sure older people have access to services.”**

**Diana Hiscock, Global Humanitarian Inclusion Advisor, HelpAge International**

#### Barriers faced

 Physical barriers and lack of safety	Older people often have impaired physical conditions due to age, which results in difficulty taking care of themselves. They are also at risk of mental health issues due to social isolation and increased risk of diseases.
 Prohibitive costs and requirements	As many are no longer in the workforce, elderly people without support systems are at risk of poverty, homelessness and poor living conditions, which makes them more vulnerable to the impacts of climate emergencies. HelpAge International’s 2020 analysis finds that in 11 countries requiring humanitarian assistance, 20 per cent of more than 8,000 interviewed older people declared themselves homeless, 77 per cent had no income, while 36 per cent did not have access to sanitation facilities and 25 per cent did not have access to safe drinking water. <sup>93</sup>



Limited access to information

Older people may find it challenging to receive and understand information due to lack of digital access or illiteracy. In climate events, older people have difficulties self-evacuating due to limited mobility and insufficient access to information or early warning systems. Older people constituted 75 per cent<sup>94</sup> and 40 per cent<sup>95</sup> of those who died during Hurricane Katrina in the Greater New Orleans area and Typhoon Haiyan in the Philippines respectively.

#### Some intersectional considerations

- Older indigenous people face challenges in accessing health services, including the locality, accessibility by transport, cost and cultural appropriateness of health services.<sup>96</sup>
- As women have a longer life expectancy than men, they are more likely to live more years in poor health than older men. In some cultural contexts, they can be abandoned when their husbands or children die, with little social security due to lack of education or employment, and facing gender discrimination in property and inheritance rights.<sup>97</sup>

#### Empowering older people

Older people play a vital role in their families and communities, especially in times of crisis. Indigenous elders, in particular, hold intergenerational knowledge on how to care for the land and water. Their lived experiences can provide information on past climatic histories or socio-environmental relationships and can be key to understanding and addressing a community’s climatic vulnerability. Inclusive or age-friendly infrastructure for older people recognizes their physical limitations and sensitive health conditions, which create the need for clean and safe environments. Further, it recognizes that the proper dissemination of information, particularly during disaster events, may require the use of accessible formats.<sup>98</sup>



## Climate impacts

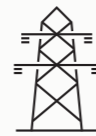
Older people are vulnerable to health risks brought about by extreme weather events. Heat waves, cold temperatures, drought, high precipitation and floods can spread vector-borne diseases, water and food insecurity, and increased pollution. Older people are also more vulnerable to climate emergencies due to their limited physical mobility or economic condition.

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF OLDER PEOPLE



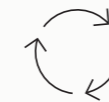
### Climate compatibility

- Access to relevant information during disaster and extreme climate events
- Emergency exits and evacuation infrastructure that consider the elderly's reduced mobility and stamina
- Mitigation and reduction of extreme heat through green and blue infrastructure and shaded public spaces
- Climate-compatible production and distribution systems to ensure access to nutritious food and clean drinking water



### Energy

- Uninterrupted energy in healthcare facilities and older people's homes



### Waste management

- Assistance in managing waste
- Reduced exposure to hazardous waste<sup>99</sup>



### Transport

- Safe streets and walking paths with adequate lighting
- Pedestrian crossings and longer traffic lights with consideration for older people's walking pace
- Accessible and subsidized public transport, especially in remote locations
- Benches and covered areas along walking paths and in public spaces



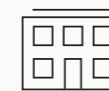
### Digital communications

- Digital skills to access services, e.g., online health and social services
- Appropriate media formats for older people



### Water and sanitation

- Affordable and clean drinking water and adequate sanitation
- Safe and accessible design of toilets, e.g., with grab rails



### Buildings

- Design for reduced mobility and stamina
- Signs in local languages
- Access to affordable healthcare, social service facilities and housing


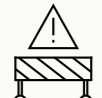
## 2.2.4 Persons with disabilities



Persons who have long-term physical, mental, intellectual or sensory impairments that, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.<sup>100</sup>

**“When accessing water in a village, it is likely that not all types of disabilities are addressed. Persons with hearing or psychosocial disabilities may be able to access these services, but persons with visual, mobility, or cognitive impairments most likely cannot. But even if some PWDs have access, they still face challenges with the attitudes of the other people using these facilities. For example, in Nigeria, we have learned that people with intellectual disabilities are mostly neglected in water, sanitation and hygiene projects. First, they have to seek additional assistance to access those facilities. Second, their caregivers have to be totally on guard 100 per cent of the time to make sure that they are well attended to.”**

**Shivani Gupta, Technical Advisor for Inclusion, CBM**

### Barriers faced

 <p>Discrimination and social exclusion</p>	<p>People may be living with one or more forms of disability, such as physical, sensory or cognitive impairment. Due to institutional, environmental and attitudinal barriers that PWDs face in their daily lives, they are at risk of social exclusion and being unable to fully participate in society.<sup>101</sup></p>
 <p>Physical barriers and lack of safety</p>	<p>In contexts where infrastructure services are non-accessible – for example, due to limited wheelchair accessibility or faulty lifts – PWDs must depend on other people for daily activities, reducing their access to socio-economic opportunities.<sup>102</sup></p>

 <p>Limited access to information</p>	<p>Persons with visual, auditory or reading impairments may have difficulty accessing information about their surroundings, which can lead to confusion or physical risk.</p>
 <p>Lack of access to decision-making</p>	<p>Depending on the level of disability, PWDs may be dependent on other people for daily activities and lack the agency to make decisions about their lives.</p>

### Some intersectional considerations

- PWDs are more at risk of multidimensional poverty, as they are more likely to have lower educational attainment, lower employment rates, and higher medical expenses than non-PWDs.<sup>103</sup> They may also have to pay more to overcome non-inclusive infrastructure development, such as paying additional costs for accessible housing or transport.
- Female PWDs are more likely to experience violence and abuse than women without disabilities. In some cases, their reports of abuse are dismissed by police and social services on the basis of their disabilities making them “unreliable witnesses” or unable to identify their perpetrators.<sup>104</sup>




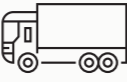

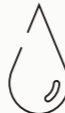
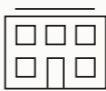
### Empowering PWDs

Inclusive infrastructure for PWDs considers that people living with any form of disability have unique needs when it comes to accessing infrastructure services and safety in emergency situations. It empowers PWDs to equitably and independently participate in society, including safely navigating the built environment and participating in decision-making processes for programmes in which they are the intended beneficiaries.

## Climate impacts

PWDs are two to four times more likely than non-PWDs to be injured or killed in disasters. They are less likely to evacuate during a disaster because of inaccessible transport and evacuation centres that cannot accommodate their needs. They may become stranded because they are unable to self-evacuate due to physical limitations or lack of access to relevant information. Further, damage to property from climate events can prolong the recovery period for PWDs and lower their standard of living.<sup>105</sup>

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF PWDs

 <p><b>Climate compatibility</b></p> <ul style="list-style-type: none"> <li>• Appropriate exit width and turning radius for people in wheelchairs to evacuate during emergencies</li> <li>• Adequate lighting, signage and sensory guides, and appropriate alert systems for people with visual and auditory impairments</li> </ul>	
 <p><b>Energy</b></p> <ul style="list-style-type: none"> <li>• Reliable energy sources for assistive devices</li> </ul>	 <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• Assistance with waste management</li> </ul>
 <p><b>Transport</b></p> <ul style="list-style-type: none"> <li>• Wheelchair-accessible transport modes</li> <li>• Safe and reliable walkways</li> <li>• Auditory cues and tactile pavers at crossings</li> </ul>	 <p><b>Digital communications</b></p> <ul style="list-style-type: none"> <li>• Accessible digital devices, e.g., braille on buttons, text-to-speech, GPS systems with audio</li> <li>• Accessible alternative communication methods according to specific disabilities</li> </ul>
 <p><b>Water and sanitation</b></p> <ul style="list-style-type: none"> <li>• Grab rails, adequate wheelchair space, and emergency call buttons in toilets</li> </ul>	 <p><b>Buildings</b></p> <ul style="list-style-type: none"> <li>• Accessible design in buildings, e.g., ramps, braille, tactile pavers and signage</li> <li>• Affordable housing with accessible design</li> </ul>




## 2.2.5 Women and girls


Persons who identify as women within their culture and context, with girls being under the age of 18 and women being 18 years or older.

**“There are instances when a woman separates from her husband, she becomes homeless because the house is commonly under the husband’s name. By providing a house under a woman’s name, she is economically empowered. However, many stay-at-home mothers do not have the capacity to pay for a home, so we need to find a balance to improve inclusion in housing programmes.”**

**Arcille Catherine Raagas, Habitat for Humanity Philippines**

### Barriers faced

 <p>Discrimination and social exclusion</p>	<p>Women and girls around the world face various barriers related to sociocultural norms and expectations, sexual or gender-based harassment and violence, and reproductive health needs.</p>
 <p>Physical barriers and lack of safety</p>	<p>One in three women globally have been subjected to physical or sexual violence at least once in their lifetime, which leads to increased likelihood of depression, anxiety disorders, unplanned pregnancies, sexually transmitted infections and HIV.<sup>106</sup></p>
 <p>Prohibitive costs and requirements</p>	<p>In some contexts, discriminatory laws prevent women and girls from accessing education, owning property, or entering employment without the consent of their husbands or families. There are also other laws that fail to protect the rights</p>

	<p>of women and girls, such as obedience laws, certain laws on age of marriage and consent, and limited maternity policies.<sup>107</sup></p>
 <p>Lack of access to decision-making</p>	<p>In some contexts, women and girls lack agency and decision-making power in their daily lives while also bearing the burden of care responsibilities, which results in time poverty and unequal economic opportunities.<sup>108</sup> Increasing water scarcity due to climate change can exacerbate women’s time poverty by making sources of water and wood harder to find.</p>

### Some intersectional considerations

- Pregnant women in rural areas face increased health risks to both mother and child during pregnancy and up to one year post-partum.<sup>109</sup> This is often due to limited access and long distances to healthcare facilities. Rural healthcare facilities may also lack adequate or specialized services and staff.
- Women and girls belonging to a racial or ethnic minority often face double disadvantages at the intersection of gender and ethnicity. They are less likely to complete secondary school<sup>110</sup> and are paid significantly less than their male or non-minority counterparts.<sup>111</sup>

### Empowering women and girls

Women and girls are catalysts of change who promote and adopt new climate solutions and knowledge in their communities. Inclusive and climate-compatible infrastructure for women and girls takes into consideration their need for safety from sexual violence or GBV. It also acknowledges their daily lifestyle patterns, which are more likely to involve domestic and care responsibilities, and thus empowers women and girls with equitable access to opportunities by reducing time poverty and increasing safe access and capacity to use essential services, especially during sudden-onset climate disasters.

## Climate impacts

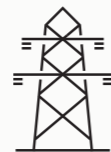
Women and girls are vulnerable to long-term climate change-related stresses on food and water security as they are more likely to be responsible for domestic responsibilities. In terms of infrastructure services, gender dynamics have effects on limited access to disaster- and evacuation-related information, unsafe evacuation or relocation facilities, limited financial resources due to time poverty, and limited access to employment opportunities. Women and girls are also more likely to experience violence after disasters due to increased post-disaster stressors and environments that enable such violence, such as situations in which law enforcement has failed and unsafe camps and shelters with a lack of privacy.<sup>112</sup>

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF WOMEN AND GIRLS<sup>113</sup>



### Climate compatibility

- Resilient design of homes and community facilities
- Access to education about nature-based climate mitigation and adaptation
- Gender-responsive information and dissemination of early warnings regarding climate events, locations and design of evacuation shelters and procedures, as well as humanitarian assistance
- Gender-responsive evacuation shelters that provide well-lit and safe sanitation areas to reduce the risk of sexual violence
- Improved access to safe drinking water to help reduce time poverty in the context of increasing droughts
- Gender equality in employment opportunities from investments in renewable energy, green transport, and other climate-related initiatives



### Energy

- Affordable access to clean fuels for cooking and renewable electric lighting to reduce time poverty and health hazards



### Waste management

- Safe waste management systems, especially for women involved in informal waste collection



### Transport

- Transport planned for gender-differentiated travel patterns
- Spaces for pregnant women and child strollers
- Safe and well-lit paths, stops and transport modes



### Digital communications

- Access to digital skills and communications services
- Digital infrastructure to access online learning opportunities



### Water and sanitation

- Safe and adequate sanitation services for menstrual hygiene
- Access to clean potable water in homesteads, especially in rural areas



### Buildings

- Safe buildings, especially in conflict-affected areas
- Access to adequate and safe reproductive health services
- Access to mental and psychosocial well-being services to survivors of GBV

## 2.2.6 LGBTIQ+ people

An acronym for lesbian, gay, bisexual, transgender, intersex, and queer people. The plus (+) sign represents people with diverse sexual orientations, gender identities, gender expressions, and/or sex characteristics (SOGIESC) who identify using other terms or none.<sup>114</sup>

**“There is a huge lack of data on LGBTIQ+ people and their specific needs, and this makes them invisible in policymaking and hinders institutions from working on large-scale actions aimed at solving collective problems. However, it is very likely that the country will once again carry out the Demographic Census without including questions that help define the profile of this population, on the grounds that identity issues are subjective and that prejudice and ignorance can influence the results.”**

**Helen Faquinetti, Head, Instituto Mais Diversidade**

### Barriers faced



Discrimination and social exclusion

LGBTIQ+ individuals face legal, social and ideological forms of exclusion, which results in them being denied access to the services and rights that all people should have.<sup>115</sup> They comprise 20 to 40 per cent of homeless populations, which can lead to increased substance abuse, sexual assault, and poverty.<sup>116</sup>



Physical barriers and lack of safety

Due to exclusion, they are also highly susceptible to discrimination and GBV: a study in the United States of America found that LGBTIQ+ people are nearly four times more likely to become victimized by violent crimes than non-LGBTIQ+ people.<sup>117</sup> After climate-related disasters, unsafe relocation sites and evacuation centres can place LGBTIQ+ people at further risk of harassment or violence.



Lack of access to decision-making

LGBTIQ+ people have limited representation in governments and are subject to discriminatory laws that limit their freedom of choice. At least 69 countries in the world criminalize same-sex relationships and at least 9 countries criminalize transgender and non-conforming gender expression.<sup>118</sup> A global review of disaster risk reduction and climate change laws, policies, strategies and plans in the 193 UN Member States found that none explicitly include LGBTIQ+ people.<sup>119</sup> This oversight exacerbates their vulnerabilities and marginalization.

### Some intersectional considerations

- Lesbian, bisexual and queer women may be forced into heterosexual relationships, marriage or conversion therapy, or be pressured to bear children by their families under threats of disownment, violence or death. In contexts with laws criminalizing LGBTIQ+ relationships, they can face blackmail and extortion with threats of being “outed” to the police.<sup>120</sup>
- LGBTIQ+ older people face exclusion and discrimination over their lifetimes, which affects well-being in older age.<sup>121</sup> Legal and social discrimination over the years may have restricted them from marrying, having children, or being involved in their communities, thus limiting their social support as they age. They also face the risk of being mistreated in long-term care facilities or health centres due to their sexual orientation or gender identity.

### Empowering LGBTIQ+ people

Inclusive infrastructure for LGBTIQ+ people prioritizes their safe and equitable access to services. Particularly for transgender, queer and intersex people, gender-sensitive design of toilets (and other typically gender-segregated spaces) is necessary to respect gender identities and reduce social exclusion.

## Climate impacts

Climate-related disasters can disproportionately affect LGBTIQ+ people because they often lack access to resources to cope with and adapt to disasters. In the Philippines and Indonesia, for example, many LGBTIQ+ people face discrimination, which limits their economic opportunities in informal employment, restricting their ability to financially cope with the impacts of climate disasters. They may also lack adequate information about climate change and disaster preparedness because of social exclusion and may face discrimination at emergency shelters or during relief aid distribution.<sup>122</sup>

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF LGBTIQ+ PEOPLE



### Climate compatibility

- Information dissemination regarding climate events, locations of evacuation shelters and procedures
- Gender-responsive evacuation shelters that provide well-lit and safe sanitation areas to reduce the risk of GBV



### Transport

- Safe and well-lit streets and transport terminals



### Digital communications

- Communication services for access to online support systems, learning and employment opportunities



### Water and sanitation

- Safe sanitation facilities that respect gender identities



### Buildings

- Affordable, safe and adequate housing
- Healthcare facilities with private rooms and gender-responsive psychosocial services

## 2.2.7 Indigenous people

People with distinct social, economic or political systems including language, culture and beliefs who have a strong link to ancestral territories and surrounding natural resources. They often form non-dominant groups of society and have a historical continuity with precolonial and/or pre-settler societies.<sup>123</sup>

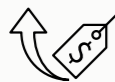
### Barriers faced



Lack of access to decision-making



Discrimination and social exclusion



Prohibitive costs and requirements

Indigenous people face barriers related to the lack of legal recognition of their rights, property and institutions. They are often excluded from consultations and decision-making processes, which can lead to economic vulnerability, discrimination and exploitation. The lack of legal recognition can also translate into difficulties accessing infrastructure services outside the indigenous community.



Physical barriers and lack of safety

While indigenous people are in need of adequate infrastructure services in their communities, they are also at risk of losing their ancestral land and livelihoods, or being injured and even killed due to forced land acquisition for large-scale infrastructure projects.



Limited access to information

Indigenous people may have difficulties accessing and understanding information that is disseminated in languages other than their mother tongue.

### Some intersectional considerations

- Indigenous women may face violence and abuse through female genital mutilation, forced marriages, polygamy, beating and forced labour. When displaced from their ancestral lands and forced to migrate, they may be exploited or trafficked into prostitution.<sup>124</sup>
- Indigenous youth may be forced to leave their traditional communities in order to pursue employment or educational opportunities, which exposes them to risks of physical and emotional violence.<sup>125</sup>
- Indigenous people worldwide are poorer than non-indigenous people and face more severe poverty.<sup>126</sup> The poverty gap for indigenous peoples is thus harder to overcome due to a mix of geographical and political exclusion, historical oppression and limited access to infrastructure, assets and capital, among other factors.

### Empowering indigenous people

Indigenous people are essential to the success of climate mitigation and adaptation measures.<sup>127</sup> Inclusive infrastructure for indigenous people recognizes their crucial role in sustainable natural resource management and biodiversity conservation, which is tied to their relationship with nature and ancestral lands. It recognizes the need for adequate consultation with indigenous communities before undertaking infrastructure service projects on indigenous lands to provide culturally-appropriate solutions.



## Climate impacts

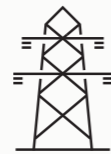
Indigenous people depend on renewable natural resources and live in geographical regions that are the most vulnerable to climate change. They are thus susceptible to poverty and displacement from their lands due to rising sea levels, droughts, forest fires, tropical storms and other hazards. Infrastructure for climate mitigation and adaptation that is developed without consultative processes may have negative consequences for indigenous communities. For example, the construction of hydroelectric dams on indigenous lands has led to the displacement, intimidation and killing of indigenous people.<sup>128</sup>

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF INDIGENOUS PEOPLE



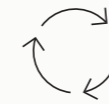
### Climate compatibility

- Meaningful and participatory consultation with communities, drawing on their traditional knowledge for climate-compatible infrastructure projects on indigenous lands
- Quality infrastructure systems that reduce risks to biodiversity and natural ecosystems
- Early warning systems in native languages
- Employment opportunities in the development of climate-compatible infrastructure in their communities to build their adaptive capacity to climate shocks



### Energy

- Reliable and clean energy sources



### Waste management

- Effective waste management systems for remote locations
- Reduced waste polluting water bodies connected to indigenous lands



### Transport

- Affordable and accessible transport options, especially in remote locations



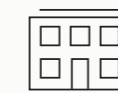
### Digital communications

- Access to communication services in remote areas
- Digital content in native languages<sup>129</sup>



### Water and sanitation

- Clean water, especially in remote locations



### Buildings

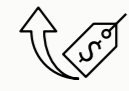


- Safe access to adequate healthcare and education services in native languages



## 2.2.8 Refugees and internally displaced persons

Refugees are persons outside their countries of origin who need international protection because of feared persecution or a serious threat to their life, physical integrity or freedom in their country of origin as a result of persecution, armed conflict, violence or serious public disorder.<sup>130</sup>

Internally displaced persons (IDPs) are persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border.<sup>131</sup>

### Barriers faced

 Prohibitive costs and requirements	Refugees and IDPs face unique challenges due to constant movement, lack of legal status or documentation, language barriers, and limited access to public services.
 Limited access to information	
 Lack of access to decision-making	

 Discrimination and social exclusion	Refugees and IDPs face risks of social exclusion and discrimination and are often at risk of poverty due to a lack of resources or economic opportunities.
 Physical barriers and lack of safety	Refugees and IDPs face risks of violence, sexual exploitation, abuse and harassment, especially in temporary camps and shelters.

### Some intersectional considerations

- Women refugees and displaced persons are at risk of sexual violence and GBV.<sup>132</sup> They may be kidnapped, trafficked or forced into marriage. In conflict-affected and fragile contexts, they may be subject to rape and sexual abuse.
- Refugees and IDPs with disabilities are often “invisible” in assistance programmes because they are not counted during registration or data collection, leading to a lack of access to services.<sup>133</sup> They may also lose their support system of family and caregivers during displacement, which places them at physical risk.

### Empowering refugees and IDPs

Inclusive infrastructure for refugees and IDPs recognizes their right to access essential services that will support them in adjusting to their new environment. It empowers them within the decision-making process in order to provide safe, adequate and culturally-appropriate services.

## Climate impacts

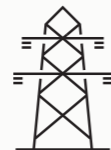
Around 216 million people could be internally displaced due to slow-onset climate change impacts by 2050.<sup>134</sup> Meanwhile, other people displaced for non-environmental reasons often relocate to climate change hotspots and may thus be at risk of secondary displacement.<sup>135</sup> The instability of shelters for refugees and IDPs can lead to psychosocial impairments and difficulty integrating into the new environment and society.

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF REFUGEES AND IDPS



### Climate compatibility

- Gender-responsive relocation sites for refugees and IDPs with safely managed and adequate infrastructure services, located in low-hazard sites
- Participatory process in creating new community infrastructure



### Energy

- Reliable and compact energy sources



### Waste management

- Safe waste management in displacement sites



### Transport

- Access to affordable and gender-responsive transport to employment and services
- Reliable transport for humanitarian aid



### Digital communications

- Access to digital services for navigation, language translation, and legal and administrative processes
- Access to online learning and employment opportunities



### Water and sanitation

- Safely managed and gender-responsive water and sanitation facilities for displacement sites



### Buildings

- Culturally-adapted and gender-responsive school facilities
- Appropriate and adequate housing that allows for social distancing




## 2.2.9 People living in poverty

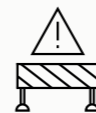
People living in a condition characterized by sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights.<sup>136</sup>

**“In the Philippines, more than a third of the population are considered low-income. However, the government focuses mainly on the poor and middle-income for housing programmes, so the low-income segment of the population who are incrementally building their houses (around 3.2 million families) are not being served by either the public or private sector. Most of them are in the informal sector as well, and they are socio-economically vulnerable.”**


*Jessan Catre, Habitat for Humanity Philippines*

### Barriers faced

 <p>Prohibitive costs and requirements</p>	<p>People living in poverty lack access to adequate resources that fulfil their basic needs and support their right to live a dignified life and fully participate in society. This also translates to additional costs to access essential services, such as having to hire private transport modes where public transport services do not reach.</p>
 <p>Discrimination and social exclusion</p>  <p>Lack of access to decision-making</p>	<p>By being unable to economically participate in society, they are at risk of social exclusion, discrimination, insecurity and powerlessness in decision-making.</p>



Physical barriers and lack of safety



Limited access to information

People living in poverty tend to engage in informal modes of living, including housing and employment. This often leads to risks of violence and illness due to unsafe living environments and lack of access to services, including information that can help them understand and avoid climate-related risks.

### Some intersectional considerations

- Children living in poverty in rural areas may be involved in labour-intensive tasks at home, such as water and fuel collection or farming activities. Coupled with inadequate transport systems, the lack of essential infrastructure services in rural households can create additional time burdens for children that affect their educational opportunities in terms of attending school or doing homework.
- The majority of people living in poverty are women.<sup>137</sup> Gender inequality results in women being paid less than men, while also doing twice as much unpaid care work. Many women also work in the informal sector, making them vulnerable to fluctuations related to climate and inadequate infrastructure. Women who live in informal settlements are at more risk of violence than the general population.<sup>138</sup>

### Empowering people living in poverty

Inclusive infrastructure for people living in poverty recognizes their right to safe and adequate infrastructure services. It empowers them to fully participate in society by providing secure and reliable services that reduce their time poverty and susceptibility to illness, violence or displacement.

## Climate impacts

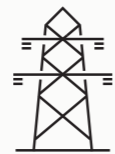
Many people living in poverty live in rural areas and work in agriculture, producing the majority of the food in developing countries.<sup>139</sup> Their food security and livelihoods can be compromised by climate change, which can lead to deteriorating health, increasing poverty, or displacement.<sup>140</sup> People living in poverty may also live in areas that are more susceptible to hazards, such as informal settlements located in environmental protection areas. Further, inadequate access to infrastructure services in poor communities may lead to risky forms of informal service provision, such as groundwater pumping, which can lead to soil subsidence.

## GENERAL INFRASTRUCTURE SERVICE NEEDS OF PEOPLE LIVING IN POVERTY



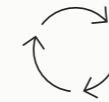
### Climate compatibility

- Communities with safely managed and adequate infrastructure services, located in low-hazard sites
- Considerations for livestock in evacuation facilities
- Employment opportunities in infrastructure projects, especially after a disruptive climate event
- Climate-compatible infrastructure to improve adaptive capacity against food and water insecurity
- Quality infrastructure systems that reduce risks to biodiversity and natural ecosystems



### Energy

- Affordable access to reliable and renewable energy and clean cooking fuels with flexible payment options



### Waste management

- Safe waste management systems in low-income communities
- Recycling as a source of income



### Transport

- Access to affordable and gender-responsive public transport to employment and education opportunities
- Safe, well-lit paths and access to communities



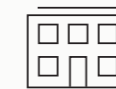
### Digital communications

- Access to digital services, technologies and skills to engage in modern economic systems



### Water and sanitation

- Affordable, reliable, gender-responsive and safely managed water and sanitation services with flexible payment options



### Buildings

- Access to affordable and adequate housing, education, healthcare and social services with flexible payment options

### 2.2.10 Other groups

There may be other types of marginalized groups depending on national context, such as religious, ethnic or racial minority groups, class groups (for example, caste-based groups), immigrant groups, people living in remote areas and so on. It is necessary to identify the specific barriers they face and the infrastructure service needs that must be addressed within their context.

## 2.3 Approaching inclusive infrastructure through an intersectional perspective on climate vulnerability

This section presents a general view of the experiences of different social groups when it comes to the systemic barriers and climate change impacts they face, as well as their needs for different types of infrastructure services in order to be empowered and more resilient to climate change. **These profiles highlight that inclusive infrastructure can take different shapes for different types of people, meaning there is no one-size-fits-all approach to inclusive infrastructure.**

**It is also important to note that people's social identities can change over time and across different contexts, which can make them more or less vulnerable to the impacts of climate change.**

For example, an informal street vendor can become more vulnerable and less resilient to climate change impacts if she gets into an accident that causes permanent disability and an inability to resume her livelihood.

An intersectional perspective acknowledges that vulnerability is dynamic and results from people living in vulnerable situations caused by social inequalities and systemic barriers, rather than being inherently vulnerable due to their social identities.<sup>141</sup> **Therefore, an intersectional approach to inclusive infrastructure addresses the root causes of vulnerability, which are the social inequalities and systemic barriers that women and marginalized people face in their contexts.** The principles for an inclusive approach to infrastructure are explored in the following section.

## Section 3

# Principles for an inclusive approach to infrastructure development

**Inclusive infrastructure is transformative in uplifting people's lives.** It addresses dynamic situations of vulnerability to climate change by removing inequities and systemic barriers preventing marginalized groups from accessing and using sustainable infrastructure services.

It respects the diversity of people's needs and provides appropriate solutions for fair access. It improves resilience and adaptive capacity to allow societies to cope with and recover from climate impacts. Lastly, it lends people the agency to make decisions and freely participate in society.

This section explores what an inclusive approach to infrastructure development means by outlining five key principles of inclusive infrastructure. These principles respond to the diverse needs of women and marginalized people and the systemic barriers they encounter. The principles are further explained through statistics and case studies that compare the outcomes of inclusive and non-inclusive infrastructure in relation to diverse groups and marginalized people.

### 3.1 Five principles of inclusive infrastructure

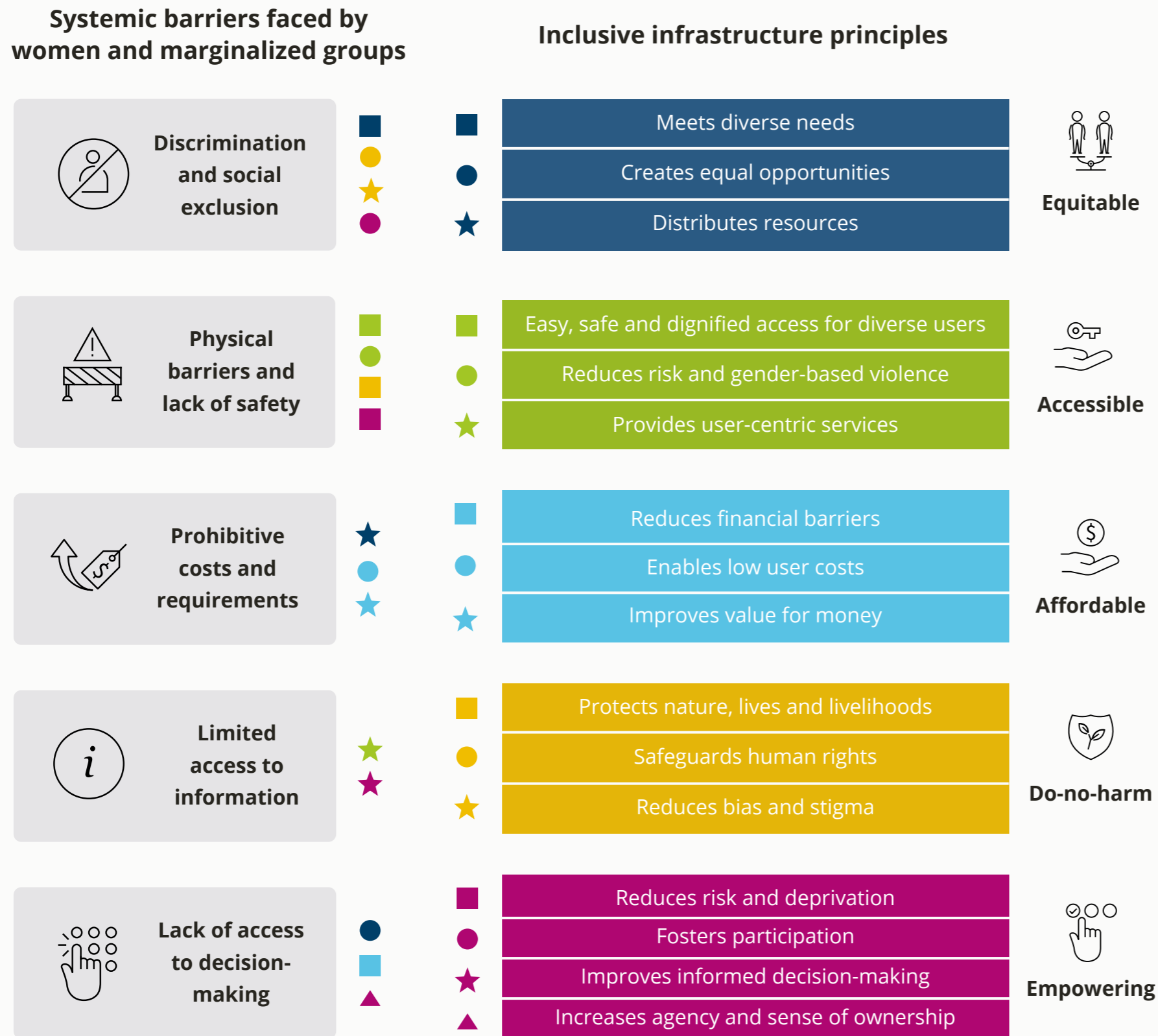
Based on a review of the literature and case studies **documenting the systemic barriers faced by marginalized groups**, we have identified five overarching principles of inclusive infrastructure.

**Inclusive infrastructure is equitable, accessible, affordable, do-no-harm and empowering.** These fundamental principles address the systemic barriers of discrimination and social exclusion, physical barriers and lack of safety, prohibitive costs and requirements, limited access to information, and lack of access to decision-making — and they do so in overlapping ways (*see Figure 5*).



© Getty Images

**Figure 5. Principles of inclusive infrastructure that address systemic barriers**





**Inclusive infrastructure is equitable.** As opposed to ‘equality’, which assumes that everyone should be treated the same way, ‘equity’ implies fair and just treatment of people in relation to identity, privilege and marginalization.<sup>142</sup> It acknowledges that in order to achieve equality and sustainability for all, different resources and solutions need to be provided for different individuals according to their needs. Equitable infrastructure counters discrimination, social exclusion, and prohibitive costs and requirements by meeting diverse needs and distributing resources in a non-discriminatory manner. It also addresses lack of access to decision-making by creating equal opportunities for all types of people. Overall, equitable infrastructure reduces climate vulnerability by improving people’s adaptive capacity and resilience against climate impacts.

**Inclusive infrastructure is accessible.** It makes essential services available and provides the means for different types of people to physically approach, enter, use and operate the same infrastructure services in an easy, safe and dignified manner. Accessible solutions accommodate people with varying physical and cognitive abilities as well as social identities, while providing them with a sense of independence and dignity.<sup>143</sup> These solutions should be accessible before, during and after climate-exacerbated disasters. Accessible infrastructure addresses physical barriers, lack of safety and limited access to information by providing user-centric infrastructure services. This includes services that are responsive to age, gender and disability, and that help reduce the risk of accidents, violence and harassment.

**Inclusive infrastructure is affordable.** It increases opportunities for people to access good quality, sustainable and resilient infrastructure services regardless of their economic means. This takes into

consideration the life cycle costs of developing an infrastructure service and ensuring that the user costs remain reasonable for different types of users, providing value for money for users, financiers and operators. Affordable infrastructure counters the excluding effects of prohibitive costs and requirements.

**Inclusive infrastructure does no harm.** It avoids exposing people or the environment to additional risks and negative impacts as a result of infrastructure development or climate change, such as loss of livelihood or increased emissions. This requires examining the broader social, environmental and economic context before implementing projects.<sup>144</sup> Do-no-harm infrastructure protects lives and livelihoods and safeguards human rights, addressing physical barriers and lack of safety. It also aims to reduce bias and stigma faced by marginalized groups, addressing social barriers such as discrimination and social exclusion.

**Inclusive infrastructure is empowering.** It 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 issues in their communities,<sup>145</sup> including infrastructure and climate action decisions. It engages people in participatory processes in order to increase their sense of ownership of community infrastructure. It also gives people opportunities to generate income and benefit from infrastructure investments, increasing their ability to cope with and recover from climate impacts. Empowering infrastructure addresses barriers such as limited access to information, prohibitive costs and requirements, physical barriers and lack of safety, and social exclusion in order to reduce uninformed choices, time poverty, physical risk, deprivation and discrimination – all of which restrict a person’s agency.



© UNOPS/John Rae

## 3.2 Equitable infrastructure

“There is a cycle of disability, exclusion, poverty, and vulnerability.”

CBM

Marginalized people face discrimination and social exclusion on the basis of their sex, gender, age, disability, ethnicity, and other factors. They become excluded from political decision-making and face prohibitive costs and legal requirements while accessing legal, health, housing, educational and economic opportunities. This leads to increased multidimensional poverty, deprivation, and vulnerability to social, economic and health risks,<sup>146</sup> which exacerbates vulnerability to climate change impacts, resulting in further marginalization and deprivation.<sup>147</sup>

Equitable infrastructure can help break the cycle of exclusion and climate vulnerability by addressing diverse needs to enable people to have equal opportunities in life and improve their resilience and adaptive capacity against climate change impacts.

**Example of equitable infrastructure:** An early warning system for floods in a riverine community integrates multiple platforms for communication to address different types of users. This can include alerts via text message, audio broadcasts and digital signboards in public areas near the river, which can be in multiple languages with simple and clear instructions. These various formats can account for auditory, visual and cognitive impairments, as well as the language needs of ethnic minorities or refugees.

## Consequences of inequitable infrastructure

### *Further marginalization and vulnerability*

Inequitable infrastructure bars marginalized groups from having the same opportunities as the rest of the population. When essential services such as running water, electricity and safe routes are not available, people are condemned to poverty and exclusion. Consequently, inequalities based on race, class, gender and age are perpetuated.<sup>148</sup> These also lead to difficulties coping with and recovering from climate-related impacts.

For example, gender-blind and inaccessible school design limits access to education. In India, almost 113 million adolescent girls risked dropping out of school after starting their first period, as only 53 per cent of government schools had a separate and usable girls' toilet in 2015.<sup>149</sup> Meanwhile, 1.4 million Pakistani children with disabilities were not part of the formal education system in 2015, as only 5 per cent of schools in the country had accessible features.<sup>150</sup>

### *Growth of impoverished communities*

Inequitable access to infrastructure services exacerbates dismal living conditions. Lack of access to clean water and sanitation leads to decreased school attendance, missed workdays and malnutrition. For instance, the climate crisis makes water availability in sub-Saharan Africa less predictable, thus accelerating hunger, health crises and poverty.<sup>152</sup>

Women often handle unpaid care responsibilities, including gathering water and firewood when services are not available. The time poverty resulting from lack of infrastructure services translates into lower economic productivity for women, particularly in rural areas.<sup>153</sup> This can be exacerbated by climate change-induced drought and heatwaves, which make it more difficult to gather water and firewood.

## Benefits of equitable infrastructure

### *Social justice and inclusion*

Equitable infrastructure can improve social justice and reduce marginalization in the long term by providing equitable access to opportunities and enhancing resilience. For example, equitable education infrastructure is necessary to provide all individuals with the right to education. This includes providing not only well-equipped school facilities but also safe transport services, adequate sanitation facilities for menstrual hygiene, as well as reliable digital communications and energy for remote learning.

This can reduce vulnerability and marginalization in the long term. Improved access to secondary education for girls in sub-Saharan Africa and South and West Asia can reduce child marriage by 64 per cent and early births for girls under 17 by 59 per cent. Areas with the lowest education inequality in sub-Saharan Africa have half the risk of conflict as areas with the highest education inequality.<sup>151</sup>

### *Breaking cycles of poverty*

Equitable infrastructure helps break cycles of poverty caused by inequalities and insensitive infrastructure planning. This includes providing essential services to impoverished communities to address basic needs and reduce time poverty for marginalized groups. Equitable infrastructure should foster decent job creation as well as sustainable and resilient outcomes.

Equitable infrastructure increases human capital wealth by 18 per cent through the reduction of household inequalities and knowledge gaps.<sup>154</sup> It is estimated that 171 million people could be lifted out of poverty if all children in low-income countries finish school with at least basic reading skills. Attaining a higher level of education can improve women's access to formal employment and reduce the gender wage gap.<sup>155</sup> Improved climate change education allows people to make informed decisions for sustainability and resilience.

### Consequences of inequitable infrastructure



© UNOPS/John Rae

Women and girls collectively spend 200 million hours every day collecting water. When water is not easily available, the burden of fetching it from remote sources disproportionately falls on them. This takes away from the time they could spend at school or work.<sup>156</sup>

### Benefits of equitable infrastructure



© Tetra Tech

Water systems using mobile payment in Tanzania, Ghana and The Gambia allow users to easily access clean water while ensuring the long-term maintenance costs of the system are paid.<sup>157</sup> This also reduces time spent collecting water in remote areas.

### 3.3 Accessible infrastructure

“It is difficult for PWDs to learn about and utilize supportive services during climate emergencies. If information is not accessible, it is not actionable. For example, if there’s an announcement that there’s a wildfire but there are no specific instructions, or if those instructions are only provided visually, then it is not actionable for a blind person. Or if people are not allowed to bring extra things on transportation, do they need to leave their wheelchairs behind? There are so many climate-connected injustices, disproportionate impacts and expectations.”

[Marcie Roth, Executive Director/CEO, World Institute on Disability](#)

Marginalized populations can have physical and cognitive difficulties in approaching, entering, understanding and using infrastructure services, in ways that other people may not experience. This includes the risk of physical or sexual harassment while approaching and using essential services such as sanitation facilities.<sup>158</sup> This can be life-threatening during climate-related disasters.<sup>159</sup>

Accessible infrastructure provides marginalized people with the means to access infrastructure services in an easy, safe and dignified manner, reducing the risk of physical or sexual violence by providing user-centric solutions that are responsive to age, gender and disability.

**Example of accessible infrastructure:** A hospital is built with both stair and ramp access to the second floor. The stairs are outfitted with railings for older people and tactile strips for visually impaired users. The ramp provides physical access for patient stretchers, wheelchair users, people with child strollers, and other people with limited mobility. During a disaster, the ramp also acts as an accessible emergency exit for non-ambulatory patients.

“There are very few persons with disabilities employed in the formal sector. Generally, persons with disabilities are working in informal sectors or are entrepreneurs, because of inaccessibility and attitudinal barriers in the formal sector.”

[Shivani Gupta, Technical Adviser for Inclusion, CBM](#)

## Consequences of inaccessible infrastructure

### *Unemployment and economic decline*

Unemployment is aggravated when people lack physical access to infrastructure services. For example, it is estimated that 80 to 90 per cent of working-age PWDs are unemployed<sup>160</sup> due to intertwined infrastructural and attitudinal barriers, such as inaccessible school design and long travel distances to accessible schools.<sup>161</sup>

This leads to economic decline when it limits marginalized people from entering the labour market. For example, unemployment among individuals with cleft lips and palates in the Philippines translated to between \$8 million and \$9.8 million in lost tax revenue.<sup>162</sup>

### *Direct and indirect costs of unsafe access*

Inaccessible infrastructure presents the risk of physical danger, which can have direct and indirect costs. This includes PWDs being at risk of fraud from relying on others to conduct transactions for them in inaccessible facilities. This can also include women, girls and LGBTIQ+ people being at risk of harassment and GBV when access to services is unsafe.

For example, toilets without safe access and conditions lead to more cases of sexual assault of women and children, as is the case in many informal settlements with outdoor latrines. This can translate into social costs of around \$53,000 per case, which could be drastically reduced by improving sanitation services to inclusively address marginalized people's safety needs.<sup>165</sup>

## Benefits of accessible infrastructure

### *Macroeconomic growth*

Mainstreaming accessibility into infrastructure has positive benefits on a macroeconomic scale. A country's GDP can increase by 3 to 7 per cent by including PWDs in the labour market – if just 1 per cent of PWDs joined the US labour force, the country's GDP could grow by \$25 billion.<sup>163</sup> This growth can improve a country's financial capacity to act on sustainability and climate action goals.

Accessible infrastructure does not require a massive investment. Studies show that accessible design will only increase the construction costs of new public buildings by less than 0.1 per cent, and up to 3 per cent on average for both multi- and single-family housing.<sup>164</sup> It is thus cost-effective and offers great societal returns.

### *Improved safety and freedom of choice*

Improving the safety of accessing and using infrastructure services can lead to marginalized people having more freedom of choice in their daily lives.

This means that PWDs and older people can independently conduct daily transactions with less risk of physical harm or fraud. This also means that women, girls and LGBTIQ+ people can physically access different services with less risk of harassment.

For example, ensuring that transport terminals and bus stops are well-lit and provided with active and passive safety features can encourage women, girls and LGBTIQ+ people to use different forms of public transport with less fear of physical or sexual harm.

### Consequences of inaccessible infrastructure



© Aimal Aazem

Children in Kabul, Afghanistan attend school in makeshift classrooms as 46 per cent of schools in the area lack proper classrooms, safe drinking water or sanitary toilets.<sup>166</sup> Lack of adequate toilets is a major obstacle for girls attending school.

### Benefits of accessible infrastructure



© AKAA/Nazes Afroz

Protective features and toilets with water storage provide reassurance to girls and their guardians that they can safely access education in Herat, Afghanistan with reduced risk of assault.<sup>167</sup>

### 3.4 Affordable infrastructure

Prohibitive costs and legal requirements in accessing sustainable infrastructure services can prompt marginalized populations to turn to alternative, informal and makeshift solutions to make up for the lack of service provision.<sup>168</sup> This can be more costly overall and may result in unsafe practices leading to loss of life and property.

Affordable infrastructure takes into consideration the financial limitations of marginalized groups in accessing quality infrastructure services, including limited and irregular income, limited access to formal loans or banking services, as well as lack of legal tenure or collateral.

**Example of affordable infrastructure:** An electric municipal train service charges a flat rate for a single ticket, regardless of travel length, which allows people living in poverty and people who live in remote locations to travel affordably around their municipality. It also provides discounts for children and youth, students and older people, which gives consideration to their limited personal finances.

#### Consequences of unaffordable infrastructure

##### *Expensive and unsafe informal service provision*

The lack of affordable infrastructure services in marginalized communities can lead to informal service provision, which may be costly. For example, informal water vendors supply water to disadvantaged households not connected to the municipal water supply. While more flexible in terms of providing water based on need and location, the cost of informal water provision can be around 10 times the cost of piped water.<sup>169</sup>

In other cases, informal services can cause serious risks to people when they are executed in an unsafe manner. For example, some informal settlements create illegal connections to existing electrical lines; however, the overloading of electrical connections can lead to the risk of fire. In South Africa, around 15 to 30 fires occur in informal settlements daily, causing at least one death per day.<sup>170</sup>

#### Benefits of affordable infrastructure

##### *User-focused infrastructure services*

Providing alternative modes of payment can help make quality infrastructure services more affordable for marginalized populations. In many African cities, prepay systems for water and electricity provision have been introduced in informal settlements to address the affordability of service provision for people living in poverty in urban areas. In Nakuru, Kenya, the cost of a 20-litre can of water went from 6 to 10 Kenyan shillings as sold by vendors to just 1.2 Kenyan shillings from prepaid standpipes.<sup>171</sup>

In Kenya, several programmes provided subsidies so that legal electrical connections for informal settlements were at the same price or lower than those of informal vendors. This created 150,000 new connections within a year,<sup>172</sup> helping reduce electrical fires and electrocutions.



### Consequences of unaffordable infrastructure



© Adam Cohn

Informal electrical connections are a safety hazard, particularly in informal settlements where houses are built closely together with flammable materials.

#### *Unused infrastructure despite high demand*

Unaffordable infrastructure services can lead to unused infrastructure despite backlogs in service provision. For example, empty housing is common in many cities around the world despite a large housing backlog because of unaffordable prices.<sup>174</sup> To illustrate, 15.8 million unoccupied homes in India could address half of its housing backlog. In 2011, there were 5 million empty homes in Mexico that could have met half of its housing needs.

### Benefits of affordable infrastructure



© UNDP

Solar cookers can help reduce energy poverty and mitigate health issues caused by air pollution from dirty cooking fuels.<sup>173</sup>

#### *Needs-responsive services*

Affordable infrastructure services should take into account the needs and financial capacity of marginalized people. For example, people living in poverty often have irregular incomes in terms of amount and frequency of payment. Affordable services should offset large initial costs and consider flexible payment schemes for regular services and loan repayment.

### Consequences of unaffordable infrastructure



Unaffordable housing leads to the proliferation of informal settlements along rivers, railways and industrial areas.

### Benefits of affordable infrastructure



Quinta Monroy is a resettlement project that provides residents with “half a home” that they can expand over time as they have the capacity to do so.<sup>175</sup>

## 3.5 Do-no-harm infrastructure

The poorest and most marginalized communities often live in the least desirable and most risk-prone areas, which exposes them to both social stigma and the negative impacts of climate change. These areas include open land near water bodies and fault lines, and uninhabitable areas such as landfills.

Infrastructure that does no harm is planned with resilience strategies to withstand natural hazards, which can help reduce vulnerability to climate change effects. This includes less intensive use of natural resources and avoiding pollution through clean, safe and sanitary infrastructure services in marginalized communities. It also includes mitigation of

natural hazards through protective infrastructure and reduced carbon emissions. Overall, infrastructure that does no harm improves quality of life and reduces vulnerability for marginalized people.

**Example of infrastructure that does no harm:** A project to provide stable energy to a remote community first conducts an environmental and social impact assessment to ensure that the infrastructure project will do no harm across its entire life cycle, including emissions impacts from procurement, construction and personnel activities as well as impacts on livelihoods or cultural practices in the community.

## Consequences of harmful infrastructure

### Loss of homes and displacement

Harmful infrastructure in the context of climate change can lead to the displacement of marginalized populations. Rising sea levels, extreme heat, and intensified tropical storms have destroyed homes and livelihoods for many people around the world due to inadequate or ill-maintained protective infrastructure, coupled with the lack of access to resilient shelter. People are thus forced to migrate to other places for safety.



© Mohammed Hosain

Cyclone shelters in Bangladesh are constructed to protect people during cyclones. However, due to inadequate size and lack of shelter for livestock, not all people are able to use the shelters.<sup>176</sup> Further, people lose their homes and livelihoods because of inadequate flood protection systems.

### Degradation of health and loss of life

Harmful infrastructure can lead to long-term negative health effects and physical risks. For example, lack of safe water, sanitation and solid waste management can lead to respiratory or waterborne diseases. In Africa, 115 people die every hour from diseases connected to poor sanitation and contaminated water such as cholera, diarrhoea and typhoid.<sup>178</sup>

## Benefits of infrastructure that does no harm

### Secure and adequate standard of living

Article 25 of the UDHR provides everyone with the right to adequate living standards for their health and well-being, even during climate disasters. Infrastructure that does no harm is planned, delivered and managed to provide clean water and sanitation services, healthcare facilities, energy supply, and housing of appropriate scale and standard – all of which are resilient to climate risks.



© AKTC/Rajesh Vora

The Friendship Centre in Bangladesh serves as a training facility for the poorest in the country. Despite limited funding, the centre has collection systems to reduce floods and run-off to surrounding areas, and the collected water is used for fisheries.<sup>177</sup>

### Improved physical and mental well-being

Overall, infrastructure that does no harm to people and the environment also leads to improved well-being. There are health co-benefits to climate mitigation through infrastructure, such as reduced pollutants through clean energy and cooking fuels, as well as reduced transmission of infectious disease through improved water, sanitation and waste management services.<sup>179</sup>

## Consequences of harmful infrastructure

### *Intensification of climate-related vulnerabilities*

Non-inclusive infrastructure for marginalized populations can lead to increased vulnerability to climate change effects. For example, lack of adequate access to rural or informal communities can make it difficult for rescue and relief operations to reach them. Lack of communications services can mean that people are unable to access life-saving warnings and information.

Further, informal service provision to compensate for missing infrastructure services can lead to unsafe practices that intensify risks. For example, excessive groundwater pumping can lead to soil subsidence, which can increase the risk of flooding. In Iran, unregulated groundwater pumping has led to cities sinking by 25 cm per year.<sup>180</sup>



© Getty Images

Without resilient road and drainage infrastructure, floods can impede access to communities and hinder rescue and relief operations.

## Benefits of infrastructure that does no harm

### *Better resilience against risks*

Addressing the essential service needs of marginalized groups is beneficial for protecting the environment and people. It can reduce the negative environmental consequences of unsafe practices, such as groundwater contamination from excessive pumping, pollution from dirty cooking fuels, and contamination from untreated sewage and unmanaged waste disposal.

Providing essential services can help build the resilience of marginalized people in many ways, such as improved health, financial capacity and decision-making power. These all help increase the capability of marginalized people to cope with and recover from climate impacts.



© UNOPS

A kilometre of garbage was cleaned up and a 400 metre drainage system was constructed in Dar es Salaam, Tanzania. This project helped reduce flooding risks and mitigate long-term health hazards posed by stagnant water and waste.

## 3.6 Empowering infrastructure

Marginalized people can have limited opportunities and a lack of autonomy to make decisions about their lives and communities. This can be due to social exclusion and inequality prohibiting them from participating in decision-making processes. It can also be due to a lack of access to information, prohibitive costs, legal requirements or physical barriers.

To culminate in inclusive and climate-compatible long-term outcomes, infrastructure development should obtain the broad support of affected communities, and contribute to enhancing livelihoods and social well-being over the entire life cycle of the infrastructure service and across multiple generations.<sup>181</sup> Empowering infrastructure increases the ability of marginalized people to make decisions about their personal lives and communities, helping adequately address their various needs and removing barriers to full participation in society.

**Example of empowering infrastructure:** A water collection point is installed in a water-scarce neighbourhood where women and children used to walk for hours every day to collect water. This reduces the time spent fetching water and empowers the locals to have more freedom to spend their time attending school or engaging in economic activities.



## Consequences of disenfranchising infrastructure

### *Reduced opportunities*

When people face limited opportunities as a consequence of non-inclusive infrastructure development, they become disenfranchised. For example, a lack of affordable and safe mobility options in rural areas can reduce economic opportunities for people living in poverty in rural areas. Studies in Papua New Guinea, Ethiopia and Pakistan show correlations between poor rural connectivity and poverty due to limited access to education, markets and diverse economic opportunities.<sup>182</sup>

### *Lack of autonomy and increased dependence*

Infrastructure can also disenfranchise people by hindering their autonomy and increasing their dependence on others. This can have a significant impact on people's mental well-being and their self-image. For example, a lack of ramps or elevators in a government building means that a wheelchair user may need to depend on other people to access upper floors.



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Lack of accessible design leads to a paraplegic man being forced to climb down the steps in the Nigerian House of Representatives.<sup>184</sup>

## Benefits of empowering infrastructure

### *Increased freedom of choice*

When adequate infrastructure services are provided to marginalized people, they can be empowered with better capacity to make choices in their lives. For example, providing reliable, affordable and clean energy and digital communications services to households allows youths to use online learning platforms to boost their skills and education levels. This can help them pursue career paths of their choosing. It can also enhance civic and political engagement in the youth.<sup>183</sup>

### *Increased agency and sense of dignity*

Empowering infrastructure provides people with a sense of agency and dignity. They are not made to feel lesser than others, because they are allowed to freely move in and interact with their surroundings. For example, gender-sensitive design of toilets can help transgender people feel recognized, safe and comfortable when accessing toilet facilities in public buildings.



© Roni Cnaani

Bikurim Inclusive School is designed to celebrate the diversity of students. The use of half-circular seating benches allows children in wheelchairs to easily join group activities. Calm colors are used to avoid sensory overload for children on the autism spectrum.<sup>185</sup>

## 3.7 Inclusive principles in the context of climate

If no action is taken, climate change will severely impact modern society by elevating the cost of living, increasing infrastructure investment needs, and significantly disrupting economies and ecosystems. All infrastructure systems are at risk of service disruption and damage from climate change impacts, especially from increased floods and tropical cyclones.<sup>186</sup> Extreme heat will overwhelm power grids and bring air transport to a halt as temperatures exceed operating tolerances.

This impact on infrastructure systems will affect all people, especially women and the most marginalized. Inequalities will be further amplified as essential services are disrupted and nature-dependent livelihoods placed at risk. Inclusive principles must therefore be applied to climate action in order to produce equitable outcomes for all people.

**Climate-compatible infrastructure that is equitable, accessible and affordable to women and marginalized groups can make low-emissions development pathways more effective and feasible.**

Women and marginalized people all over the world make decisions that influence the amount of greenhouse gasses released in the atmosphere. In societies where women bear the majority of domestic responsibilities, they can make impactful contributions to climate action pathways when they have equitable, accessible and affordable services such as clean cooking fuels, safely managed water and sanitation, climate-smart agriculture methods, and circular waste management systems.<sup>187</sup>

**Climate-compatible infrastructure that does no harm ensures that climate action results in positive impacts for people and the planet.** Infrastructure should be developed in a manner that simultaneously protects nature and safeguards human rights. For example, implementing inclusive nature-based solutions and climate-smart agriculture can improve biodiversity, absorb carbon, reduce soil erosion, improve air quality, and improve food and economic security for farmers.<sup>188</sup>

**Climate-compatible infrastructure that is empowering to women and marginalized groups can enhance climate resilience on a community and societal level.** Women and marginalized groups may be unable to participate in decision-making on climate action when their rights are not respected and their voices are not listened to. Empowering women and marginalized groups to exercise their rights in community leadership, environmental governance and policy formulation has enhanced climate adaptation and resilience in many parts of the world. For example, women have contributed to disaster preparedness efforts in Bangladesh, forest governance in India, and drought resilience in the Horn of Africa.<sup>189</sup>

Infrastructure that is both inclusive and climate-compatible leads to more effective and equitable climate action and sustainable development that leaves no one behind.

# Section 4

## Recommendations for developing inclusive infrastructure for climate action

In order to achieve inclusive infrastructure for climate action, various stakeholders need to work together to redefine infrastructure development toward greater inclusion and climate action for all. This section outlines the roles of different stakeholders across the infrastructure life cycle in the context of inclusion and climate action before setting out eight key intersectional action areas and recommendations for developing inclusive infrastructure for climate action.

### 4.1 Agency across the infrastructure life cycle

There are opportunities for action across the whole infrastructure life cycle, which is interconnected and involves a series of different stakeholders. These include planners, designers, financiers, contractors, operators, decommissioning and repurposing specialists, sociologists, inclusion specialists, Health, Safety, Security and Environment (HSSE)

specialists, climate change experts, and community members (including users, stakeholders and beneficiaries), among others. Different stakeholders have various actions in planning, delivering and managing a sustainable, resilient and inclusive infrastructure system (*see Table 2*).

### 4.2 Action areas

**An inclusive approach to infrastructure development should be mainstreamed in all infrastructure processes, policies and interventions.**<sup>190</sup> This means that a wide and diverse range of communities and stakeholders are engaged in the **entire process** of infrastructure development. Further, inclusive policies ensure that infrastructure planning and delivery are fair and accessible, and that sustainable and resilient outcomes of infrastructure development are distributed equitably. Opportunities to improve the development of inclusive infrastructure across different action areas, synthesized from the research and interviews in this report, are discussed in the following sub-sections. These action areas and the principles of inclusive infrastructure are closely intertwined (*see Figure 6*).



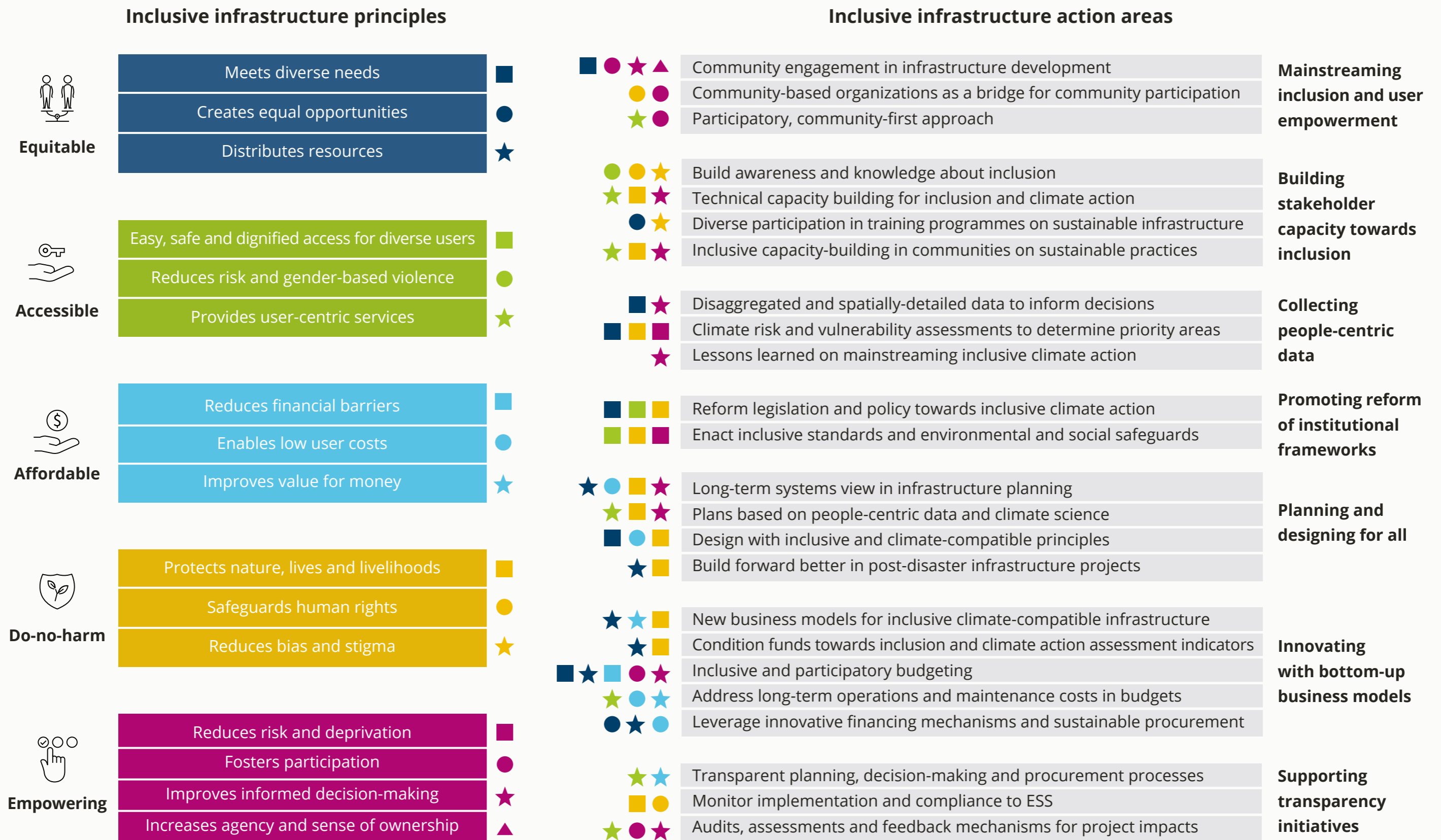
**Table 2. Actions of key stakeholders in developing inclusive infrastructure**

Life cycle stage	Actions	Stakeholders
<p><b>PLANNING</b></p>	<ul style="list-style-type: none"> <li>At the national and sub-national levels, government planners set strategic policies, regulations and standards, using levers to incentivize inclusive and sustainable development pathways and to restrict development that may lock in unsustainable outcomes and practices.</li> <li>Government planners should conduct national and sub-national needs assessments and ensure that these take into account the diverse needs of different users, especially marginalized groups.</li> <li>Civil society organizations (CSOs) representing marginalized groups should be involved in the development of infrastructure needs assessments and plans, promote inclusive legislation and policies, and act as liaisons between project teams and communities.</li> <li>Based on needs assessments, planners develop national and sub-national infrastructure plans to shape new developments. These plans look to the long term, articulating and exploiting interdependencies between multiple sectors and spatial areas. To help guide these plans, strategic assessments may be carried out to understand what a region needs and can support.</li> </ul>	<p><b>Planners, designers, specialists, CSOs and community members</b></p>

Life cycle stage	Actions		Stakeholders
<b>DELIVERY</b>	<ul style="list-style-type: none"> <li>• Early in the design of projects, planners and designers undertake participatory environmental and social impact assessments of their designs. Good practice incorporates social and environmental safeguards from the beginning of the planning and design processes (e.g., inclusive, gender-responsive grievance redressal mechanisms, inclusive and meaningful community stakeholder engagement, free, prior and informed consent related to upholding the rights of indigenous populations where and if applicable, and information disclosure).</li> <li>• Early in the project conceptualization, financiers support owners to secure capital and/or operating costs for the infrastructure life cycle. Investment from the public and private sectors is coordinated, and new delivery business models are facilitated. Costs and risks (including exacerbation of social and gender inequities) associated with a project should be considered as part of the business case.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractors and project teams implement infrastructure, along with skilled professionals across different domains, according to the standards and specifications established during the design phase. During the construction process, care must be taken to avoid negative impacts on the environment or local communities.</li> <li>• Safe and equal working conditions provide important economic opportunities for women and local workers.</li> <li>• Contractors should adopt sustainable and inclusive infrastructure procurement practices. This can include using selection criteria, contract modalities and other mechanisms to prioritize procurement from local suppliers, small and medium-sized enterprises, and women-led businesses, and reusing materials from the repurposing and decommissioning of assets.</li> </ul>	<b>Financiers, designers, contractors and project teams</b>
<b>MANAGEMENT</b>	<ul style="list-style-type: none"> <li>• Operators are responsible for operating the infrastructure as per its design and delivering the intended service at optimal efficiency.</li> <li>• Operators and government officials should regulate services to ensure that they are fairly provided to customers (including women, girls, youth, disabled people, and other marginalized groups).</li> <li>• Operators may also be responsible for monitoring the environmental performance of infrastructure systems – including the effectiveness of inclusive and climate-compatible measures.</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure maintenance ensures safety for both users and operators and prolonged performance across its lifespan and beyond the lifetime of a project/programme through inclusive, community-based and cost-effective operations and maintenance procedures. Specialists can advise on the end-of-life repurposing of infrastructure as early as the design stage, if possible. Materials can be reused through effective repurposing and decommissioning practices.</li> <li>• During and after the decommissioning of assets, specialists and community-based monitoring groups are required to assess and mitigate any long-term negative impacts on the environment or local communities, including through workforce transitions. Continuity of the infrastructure services previously provided by the decommissioned assets must be assured by other means.</li> </ul>	<b>Operators and decommissioning and repurposing specialists</b>

Adapted from the UNOPS report *Infrastructure for Climate Action* (2021)<sup>191</sup>

**Figure 6. Relationship between action areas and inclusive infrastructure principles**



## 4.2.1 Mainstreaming inclusion and user empowerment

“As American congresswoman Ayanna Pressley says, ‘The people closest to the pain should be the people closest to the power.’”

Susan Sygall, CEO and Co-Founder, Mobility International USA (MIUSA)

It is critical to improve the meaningful representation and participation of underrepresented and marginalized groups as stakeholders in all aspects of infrastructure development, to ensure that climate-compatible outcomes are shared by all. This should occur from the project level up to the planning and policy levels, and across the interconnected systems of infrastructure. This involves engaging stakeholders in an appropriate and effective manner and ensuring that diverse groups are represented in all processes.

**Recommendation 1: Engage communities in infrastructure development to ensure equitable sharing of the benefits and responsibilities of climate action.** Engaging local communities is critical to effective climate action.<sup>192</sup> It ensures that the diverse needs in the community are effectively addressed, and at the same time allows for local knowledge to inform the range of actions best suited to the community and the environmental context. This is particularly valuable in areas with limited mapping and hazard data available. In indigenous communities, local expertise and techniques can supplement technological solutions to develop climate-compatible infrastructure that does no harm to people or nature.

Communities should have equitable access to jobs and skills created by infrastructure investments,<sup>193</sup> especially when potential displacement may result from transitioning to climate-compatible infrastructure.

Making use of the local materials, workforce and skills allows infrastructure to be built and maintained by local staff and suppliers, which reduces transport costs and emissions while reinvesting the budget into the local economy. This may require adapting job roles and worksite conditions to consider different needs, such as creating office jobs for PWDs and providing safe toilets for female workers. Diverse and representative management committees can be established with local communities to ensure that projects continue to be effective and accessible to marginalized people and foster a sense of ownership in the community.

### Box 1. Emergency employment<sup>194</sup>

After conflict and disaster situations, people may lose their jobs and livelihoods. Emergency employment is direct short-term employment that can provide immediate cash income opportunities for marginalized people. Engaging local communities in emergency employment for infrastructure reconstruction projects can help contribute to inclusive building back better.



### Case study on community-based infrastructure delivery

**Recommendation 2: Community-based organizations and CSOs representing marginalized groups should act as a bridge for communities to be involved in strategic planning processes and infrastructure development.** They should be involved at all stages of government infrastructure works affecting marginalized communities, including inclusive strategic planning and needs identification for infrastructure development.

“The real challenge is that it takes a lot of time to build these relationships. The strategy is simply to be out in the community as much as possible, to get to know the people and become a trusted advocate for the community, work with existing community-based organizations or NGOs. This is so that people do come to you and give you the ideas that you can then take up with the project team.”

Gavin White, Executive Officer for the Climate Change and Resilience Committee, World Urban Parks

## Box 2. Engaging local communities in the Blue Gold Program

Project teams can directly collaborate with marginalized people to co-create inclusive infrastructure. The Blue Gold Program<sup>195</sup> set out to rehabilitate and improve water infrastructure in 22 coastal polders in Bangladesh which were at high risk of flooding. The project team used ‘natok’, a form of interactive theatre, to discuss social issues between different actors, and locals were empowered to manage water themselves through Water Management Groups.<sup>196</sup> The project has enhanced flood protection, improved food security, and reduced poverty for nearly 200,000 households.

**Recommendation 3: Project teams should adopt a community-first approach using appropriate participation and consultation mechanisms.** These should involve different user groups, especially

representatives from marginalized groups that are often left out of consultations. The consultations should be made as accessible as possible through a variety of communication and participation techniques and can be encouraged as part of funding requirements.

“Ideally, projects are driven by the community, who then invite professionals to provide technical and monetary support. This is where we could talk of climate resilience, and ensure we bring in professionals who are skilled in storm water management, carbon adaptation, mitigation, and other technology-heavy needs. These are the things we would love to bring to the table as a part of the conversation with communities.”

Gavin White, Executive Officer for the Climate Change and Resilience Committee, World Urban Parks



**Case study on participatory decision-making and planning with communities**

### 4.2.2 Building stakeholder capacity towards inclusion

Capacity refers to the ability of people, organizations and society as a whole to manage their affairs successfully.<sup>197</sup> Inclusion can be mainstreamed in infrastructure by building the understanding, sensitivity and technical expertise of infrastructure stakeholders

regarding the value and technical implementation of inclusive and climate-compatible measures.

“Based on generational and cultural understandings, our staff have different perceptions of what is acceptable in terms of inclusion. For example, what is acceptable in the way we address the menstrual hygiene needs of women and girls? In the past, this has been a critical need that was largely ignored, which is now changing. The big challenge is the perception of ‘what is accessibility’ and ‘what is resilience’. Is putting a rainwater tank going to address the broader scale issues of water shortage in communities? There’s so much that we have to sensitize our staff to, across the board, and many of them have limited opportunity to learn in terms of resources, access to the internet and training opportunities.”

[Liz Palmer, Global Construction Lead, Save the Children International](#)

**Recommendation 4: Awareness and knowledge of inclusion need to be fostered among stakeholders to identify and address biases against marginalized groups.** Infrastructure services will still remain inaccessible to marginalized people if they are socially excluded from using them. Alongside inclusive infrastructure development, governments and CSOs should organize public education and outreach activities to promote inclusion and anti-discrimination, as well as encourage reporting of abuse. Personnel who are facilitating essential services should be given sensitivity training for working with marginalized people.

### Box 3. Gender sensitivity training in UNOPS Myanmar

Hostile attitudes towards LGBTIQ+ people hinder them from accessing healthcare services. UNOPS Myanmar conducted training sessions with healthcare partners to raise awareness of gender sensitivity and the discrimination LGBTIQ+ people face.<sup>198</sup> Improving LGBTIQ+ inclusion in healthcare includes sensitization of data collection practices, training staff to be sensitive to LGBTIQ+ needs, and improving anti-discrimination policies.

### Box 4. Ensuring women’s safety on public transport in Quito, Ecuador<sup>199</sup>

Safe, affordable and sustainable public transport in cities is important for climate action because it contributes to reducing car use. The transport system in Quito, Ecuador moves more than 1 million passengers every day, 49 per cent of whom are women. A study conducted to inform the development of the Quito Safe City Programme revealed that over 65 per cent of women have experienced some form of sexual harassment in the city, often on public transport.

A multistakeholder committee was set up to better understand the use of public buses from different women commuters’ perspectives to inform the development of protocols that address sexual harassment on public transport. Over 2,600 drivers, operation staff and managers received regular training

on gender and positive masculinities, and how to implement the protocols in cases of sexual harassment. In particular, the training helped increase the police and transport authorities' awareness of sexual harassment and its legal penalties in the city. A communications strategy was also developed to raise awareness of sexual harassment and other forms of sexual violence against women and girls. The strategy targeted authorities and both men and women commuters, and it included a focus on bystander intervention.

**Recommendation 5: Capacity building should be conducted to improve the technical skills of stakeholders in mainstreaming inclusion and climate action in infrastructure development.**

Governments should have a strong understanding of inclusion in order to create and execute inclusive policies, especially in relation to climate action. Along with project teams, policymakers, regulators and planners should be trained in using participatory techniques, vulnerability analysis, value for money approaches, ecosystem services analysis, nature-based solutions, and in monitoring and evaluating the implementation of inclusive and climate-compatible measures. Local workers can be trained in sustainable construction practices.

 **Case study on building capacity and creating green jobs**

**Recommendation 6: Training and education programmes in sustainable infrastructure development should target a diverse range of participants.** Promoting gender equality, diversity and

inclusion within educational programmes can help expand ideas and knowledge about developing sustainable, resilient and inclusive infrastructure. These programmes can include university curricula, vocational training, professional institution training and continuing professional development programmes, among others.

**“There’s just not enough people in the design and the development of these ideas. In the Commonwealth context, we do not have sufficient numbers of architects, builders, town planners. There’s a huge gap in human resources to bring inclusive ideas forward. There is rapid urbanization in countries like Uganda, but who is designing those? Where are young people involved? There are not enough people who can carry on inclusive initiatives.”**

**Layne Robinson, Head of Social Policy Development, Commonwealth Secretariat**

**Recommendation 7: Inclusive capacity building programmes on sustainable practices within communities can help ensure effective management of infrastructure systems.** Local communities should be trained on how to integrate sustainable and resilient practices in their communities, especially in relation to maintaining local infrastructure systems. These programmes should target a wide range of participants, especially representatives of marginalized groups, and ensure that accessible communication techniques are used.

 **Case study on capacity building for participatory infrastructure management**

### 4.2.3 Collecting people-centric data

Disaggregated and spatially-detailed data (based on sex, gender, age, income, race, ethnicity, disabilities, migratory status and other contextually relevant indicators) can be used to drive planning processes towards the development of inclusive infrastructure. In many countries, there is limited availability of disaggregated data regarding different demographics of marginalized groups and their access to infrastructure services, thus leading to inadequate information in planning inclusive infrastructure services. For example, data on disability status is severely lacking in the Global South. Only a third of national census surveys from 2009 to 2018 in 133 low- and middle-income countries had disability-related questions.<sup>200</sup> Only 15 per cent of these data sets had functional difficulty questions to categorize disabilities by walking, seeing, hearing and cognition.

**Recommendation 8: Disaggregated and spatially-detailed data should be integrated as a baseline to inform decisions and evaluate impacts of infrastructure development.** It is critical to establish diverse user needs and avoid a one-size-fits-all approach to infrastructure development. Governments should collect spatially-detailed data disaggregated by household income, gender, age, sex, geographic remoteness, and other inclusion indicators into national census and health surveys. They can also conduct micro-census surveys to collect bottom-up population data with high spatial resolution.<sup>201</sup> This data can be used with group-specific and intersectional needs analysis and spatially correlated with infrastructure needs assessments to inform the creation of inclusive infrastructure policies.



**Case study on integrating disaggregated data in decision-making**

**Recommendation 9: Assessments such as climate risk and vulnerability assessments (CRVA) should be conducted to determine high-priority areas for climate-compatible infrastructure development.** This kind of assessment evaluates both vulnerability to and the possible impacts of climate hazards. It makes use of both quantitative and qualitative data, such as disaggregated census data and local stakeholder knowledge.<sup>202</sup> Conducting CRVAs at the national, sub-national, city or district level, as opposed to a per project basis, can help reveal climate vulnerabilities and risks in relation to physical geography and the larger infrastructure system-of-systems. Project teams should further conduct social cost-benefit analyses (SCBA) and environmental and social impact assessments to inform infrastructure and spatial planning decisions for equitable outcomes.

#### Box 5. Climate risk and vulnerability assessment in Lesotho

Acknowledging that some communities and households would be disproportionately vulnerable to climate change impacts, a CRVA was conducted in three pilot community councils in Lesotho.<sup>203</sup> The vulnerability mapping focused on agriculture, water supply, natural resources, forestry and socio-economics. Validated by the local communities, an integrated climate change risk map was developed, encompassing risks of soil erosion, flood, drought, heat and loss of agricultural productivity. This map showed which communities or areas were particularly vulnerable to climate change risks, supporting decision-making in equitably prioritizing and targeting climate adaptation infrastructure.





### Case study on conducting vulnerability assessments to inform planning decisions

**Recommendation 10: Project teams should monitor, report and document how they mainstream inclusion and climate action within infrastructure projects, as well as conduct project impact assessments to show lessons learned.** This can expand the knowledge base of inclusive infrastructure and help build a solid business case for inclusive climate action.

#### 4.2.4 Promoting reform of institutional frameworks

Inclusive infrastructure can be challenging to develop in countries with limited national policies governing equitable access of services for marginalized groups, or where there is a lack of capacity to support or enforce such policies. Further, developing countries are at different stages in recognizing marginalized groups' rights. There is an opportunity to improve homogenous recognition of these rights within country legislative frameworks, so that developing inclusive infrastructure can be supported by an enabling policy and regulatory framework. User empowerment, capacity building and people-centric data all support the creation of inclusive policies.

It is also possible that inclusive international or national policies exist but need to be better observed at lower levels of government. For example, city planning offices in the Philippines are required by national policy to create 26 different action plans for a range of inclusion and resilience themes (such as plans for poverty reduction, gender and development, the elderly, disaster management and coastal management), yet these plans are often not created due to lack of skills, human or financial resources, or recognition of their value.<sup>204</sup>

**Recommendation 11: Legislative and regulatory frameworks need to be reformed, adopted and enforced to mainstream inclusive climate action in infrastructure development.** This requires action from all stakeholders. Governments must establish, facilitate and enforce such legislation and related programmes, as well as provide accessible and adequate information regarding them to all stakeholders. Project teams should adequately understand legislation and regulation requirements and how to implement them within the project life cycle. Financiers can encourage governments to adopt inclusive legislation and regulation as a condition of infrastructure funding. Professional organizations can uphold regulation and drive standards within their industries. CSOs can campaign for the creation or amendment of regulations to protect marginalized groups.

#### Box 6. Balanced housing requirements in the Philippines

In the Philippines, the Urban Development and Housing Act outlines stipulations for the eviction and resettlement of informal settler families, providing consultative mechanisms throughout the entire relocation process. It also creates strategies for low-cost socialized housing with the participation of the private sector and urban poor communities. This includes requiring private developers to allocate 20 per cent of new housing projects for socialized housing, providing tax incentives for socialized housing developers, as well as creating a Community Mortgage Programme, which supports informal settler communities in acquiring and developing housing on a communally owned tract of land.<sup>205</sup>

Countries that do not have existing inclusive legislative and regulatory frameworks can adopt successful frameworks and standards from other countries while creating their own. It is recommended that existing frameworks surrounding marginalized groups, infrastructure and climate action be reviewed at the national and local levels in order to understand key issues and opportunities for change.

### Box 7. Adopting inclusive legislation from other countries

In Nigeria, design researcher Mathias Agbo suggests to industries the adoption of the Americans with Disabilities Act (ADA) to deliver inclusive infrastructure services.<sup>206</sup> The ADA has inspired the creation of disability laws across the world, including in Latin American countries Brazil, Chile and Costa Rica, among others.<sup>207</sup>

### Recommendation 12: Inclusive regulation and design standards, as well as environmental and social safeguards, should be properly enacted and enforced in all stages of infrastructure development.

Governments should create effective enforcement mechanisms and safeguards to drive compliance, especially for structural safety and environmental control, to ensure that infrastructure plans and projects do no harm to people or the environment. Project teams should comply with legal regulations and professional standards, which can be safeguarded by professional organizations through sanctions against industry malpractice. Appropriate health and safety practices should be adopted at construction sites. Financiers can support this by requiring certain standards of health and safety. CSOs can play a role in monitoring the performance of infrastructure services to ensure that

standards of safety, inclusion and environmental responsibility are met, especially in contexts with limited government capacity.

These regulations can also be enforced in existing infrastructure. Where economically and practically feasible, stakeholders should retrofit existing infrastructure services to facilitate inclusion, climate mitigation and adaptation.

### → Case study on building inclusive institutional frameworks

## 4.2.5 Planning and designing for all

“Will this support all end users?”

Geoffrey Morgan, UNOPS<sup>208</sup>

Inclusive infrastructure should be planned and designed proactively and holistically to support inclusive outcomes for all end users.

### Recommendation 13: Infrastructure plans and governance mechanisms for implementation should take a long-term systems view toward inclusion and climate action.

Governments should consider the long-term social, economic and environmental impacts of inclusive and climate-compatible infrastructure development within local and national development planning, in order to achieve sustainable development targets. An integrated systems view should be used to consider the whole infrastructure system and broader context of projects in order to better evaluate trade-offs and avoid maladaptive decisions. This includes understanding the connections

with other infrastructure assets, sectors, jurisdictions, and the environment, considering the risks of multiple hazards and cascading failures, recognizing the potential to implement nature-based solutions, and finding opportunities to realize multiple benefits.<sup>209</sup> Governments should also improve inter- and intra-ministerial coordination and decision-making mechanisms to achieve the desired outcomes.

**“In particular, at Habitat for Humanity, we have experienced some challenges because the different infrastructure sectors are working in silos – water, sanitation and health are working from different ministries – so bringing stakeholders together in a participatory process for a common objective is a challenge.”**

**Subject Matter Experts at Habitat for Humanity in Latin America and the Caribbean**

### **Box 8. Strategic Environmental Assessments**

In many Global South cities, large infrastructure development projects can pose risks to inhabitants of informal settlements. With the concurrence of multiple developments within the same metropolitan area, project-level environmental and social impact assessments may be insufficient to act as safeguards against negative impacts. A Strategic Environmental Assessment (SEA) can be used to ensure that environmental, social and economic aspects are evaluated at regional and national levels. An SEA includes analytical and participatory approaches that integrate environmental considerations into policies, plans and programmes, and also evaluate the inter-linkages with economic and social considerations.<sup>210</sup>

**Recommendation 14: Infrastructure plans should be based on the best available people-centric data and climate science, which should be integrated at the project level into clear and feasible targets, indicators, budgets and actions.** Gender equality and social inclusion action plans based on disaggregated data can be developed to clearly outline specific inclusion outcomes, outputs and activities in infrastructure development from national to local scale. Infrastructure plans should also integrate the best available knowledge about climate change and its effects on people, infrastructure and the environment in order to ensure that infrastructure systems and assets can be designed to remain resilient over their lifespans.<sup>211</sup>

**Recommendation 15: Infrastructure should be designed with inclusive and climate-compatible principles in mind.** Informed by inclusive evidence and participatory dialogue, designs should take an intersectional approach to account for multiple user needs. Universal Design standards can help address accessibility for PWDs, Safe City concepts can help reduce risks such as GBV, while 8 to 80 principles<sup>212</sup> help design age-responsive infrastructure by taking into consideration the needs of both children and older people.

Climate-compatible design principles should be applied to reduce energy use and carbon emissions (e.g., passive design, materials with low embodied carbon, locally sourced materials, renewable energy, water- and energy-efficient fixtures) and increase adaptation (e.g., avoid hazard-prone sites, implement up-to-date design standards for seismic, wind, and flood resilience). The specific context of the project should be taken into account to ensure that materials, systems, design and methods are appropriate and do no harm to the local social and ecological context. This includes avoiding displacement of informal settlers or destruction of natural ecosystems.

### Box 9. Mainstreaming accessibility in rehabilitated schools in Pakistan

In order to incorporate appropriate design solutions for the accessibility of PWDs, community committees were formed during the Humqadam Schools Construction and Rehabilitation Programme from 2015-2018 in Pakistan.<sup>213</sup> All schools incorporated solutions for mobility problems such as hard level paving, ramps, grab rails, wider doors, accessible toilet facilities, as well as bigger windows and highly visible chalkboards. In addition, the committees identified specific needs within each school, leading to bespoke solutions for sight and hearing issues, autism and learning difficulties as needed.

### → Case study on designing for long-term resilience

**Recommendation 16: Post-disaster recovery and reconstruction provide opportunities for inclusive and climate-compatible ‘building forward better’.** This means that diverse infrastructure needs are met, and gender-, age-, and disability-responsive principles guide the prioritization of the types of infrastructure that should be reconstructed first. For example, large roads may serve the socio-economic needs of men in gendered work roles, but women may see a more immediate need for footpaths, health centres, schools and childcare facilities.<sup>214</sup> This is also an opportunity to ensure that reconstructed assets can be more resilient to climate impacts and emit fewer emissions.

### → Case study on applying gender- and disability-responsive principles in reconstruction

#### 4.2.6 Innovating with bottom-up business models

Adequate investment in sustainable, inclusive and resilient infrastructure is a key component to realizing the SDGs and human rights.<sup>215</sup> The OECD estimates that \$6.3 trillion of investment in infrastructure is required annually on average between 2016 and 2030 to meet development needs globally, with an additional \$0.6 trillion per year making these investments climate-compatible.<sup>216</sup> The annual infrastructure financing gap in developing countries of up to \$1.5 trillion constitutes a major challenge for excluded groups to access social and economic opportunities via inclusive infrastructure.<sup>217</sup> At the moment, ineffective infrastructure business models are providing poor value to taxpayers, consumers and businesses, and negatively impacting the future of infrastructure services.<sup>218</sup>

Aside from investment, budgeting and planning for inclusive infrastructure should take into account the life cycle costs and long-term impacts of certain planning decisions on marginalized communities. For example, subsidized housing projects for internally displaced people can help serve their immediate need for shelter, but without considering the long-term financing strategy in an inclusive way, they may lead to further poverty for people who cannot meet long-term payment requirements.

**Recommendation 17: New business cases and models should be built to support and attract financing for mainstreaming inclusion and climate action in infrastructure services.** All stakeholders should ensure that infrastructure benefits as many different types of people as possible by systematically looking for opportunities to realize environmental, social

and economic co-benefits. These could include job creation, enhancement of ecosystem services, business opportunities for small and medium-sized enterprises,<sup>219</sup> and provision of public services and amenities that benefit the general population in consultation with the citizens. These co-benefits can be studied by all stakeholders in conducting value for money studies for inclusive and climate-compatible infrastructure.

### Box 10. Social cost-benefit analysis (SCBA)

The Global Infrastructure Hub<sup>220</sup> suggests the SCBA as an appraisal tool to evaluate how public investment projects benefit society. The analysis of the prices, costs and intangible benefits from the perspective of consumers, suppliers and society makes up the SCBA. Adopting the SCBA approach will strengthen available data on the benefits of inclusive infrastructure and contribute to building a solid business case in the sector.

### Box 11. Employment Impact Assessments (EmpIA)<sup>221</sup>

EmpIA can be used to assess the employment potential and impacts of infrastructure investments. It assesses the number, types, and quality of direct and indirect jobs created during the construction, operation and maintenance of infrastructure, as well as the profiles and characteristics of the workers who get these jobs. EmpIA can also be used to identify appropriate project stages where employment-intensive methods can be applied to generate more and better jobs.

**Recommendation 18: Financiers should incorporate inclusion and climate action-related criteria in project selection and funding requirements.** Funding indicators and conditions can be related to mitigation (e.g., reduction in emissions or energy intensity), adaptation (e.g., beneficiaries from vulnerable groups), gender (e.g., addressing inequalities between women and men related to climate change vulnerability),<sup>222</sup> disability (e.g., disability-inclusive elements in projects)<sup>223</sup>, and so on.

“Donors should recognize that it is their imperative to put inclusive conditions into programming, such as creating environmental mitigation and monitoring plans, and accounting for accessibility, inclusion, consultation and meaningful participation. Country offices far exceed the minimum standards when the donors have a high benchmark for what needs to be achieved. So aside from asking what are the challenges in achieving safe, inclusive and resilient infrastructure, the antithesis is to ask, what are the enablers?”

[Liz Palmer, Global Construction Lead, Save the Children International](#)

**Recommendation 19: Governments should conduct inclusive and participatory budgeting that is responsive to gender, age and disability.** Participatory budgeting empowers citizens to directly engage in the equitable distribution of public resources.<sup>224</sup> It can promote transparency and allows historically excluded groups to make choices about their environments. Inclusive budgeting should be gender-responsive<sup>225</sup>, age-responsive<sup>226</sup>, and disability-responsive.<sup>227</sup> It should recognize the different needs of women and men, girls and

boys, children and older people, and PWDs, and ensure that the needs of marginalized groups are reflected and addressed.

**Recommendation 20: Budget plans should anticipate and address, over the life cycle of the project, the long-term operations and maintenance costs required to keep infrastructure inclusive and resilient to climate impacts.** Aside from initial capital costs, asset owners should consider climate-related impacts when evaluating the cost and risks of a project, the fiscal and non-monetary benefits of climate-compatible infrastructure,<sup>228</sup> and the cost of operations and maintenance. Good maintenance can reduce the total life cycle cost of transport and water and sanitation infrastructure by more than 50 per cent.<sup>229</sup> Governments should ensure that infrastructure services remain affordable to marginalized groups through price regulations or subsidies, and use tax reform to realign funding towards inclusive programmes. This is particularly important to ensure the long-term affordability of infrastructure that is maintained through user fees (e.g., public transport) or is being repaid through long-term loans by beneficiaries (e.g., socialized housing).

**Recommendation 21: Infrastructure projects can leverage innovative financing mechanisms and sustainable procurement practices to create inclusive economic impacts.** Innovative financing mechanisms include cross-subsidies that balance the cost of affordable services, pay-per-use technologies such as prepaid service metering, and waste-for-money schemes that leverage the informal economy to improve waste management and recycling while creating green jobs. Sustainable procurement practices can reduce project costs and climate footprints through the use of local and recycled materials, as well as reinvest the funds into the local community. This can involve inclusive engagement of suppliers such as local micro, small and

medium enterprises, women-owned businesses, disability-inclusive suppliers and other diverse suppliers, e.g., youth-owned businesses or those belonging to indigenous communities or LGBTIQ+ groups.

### Box 12. Inclusive transport and cross-subsidies: Mi Teleférico cable car system in Bolivia

The Mi Teleférico cable car system in Bolivia<sup>230</sup> serves to connect the capital of La Paz to the poorer area of El Alto (which has a majority of indigenous people). It is one of the few mass transport projects globally that does not require public subsidies for operation and maintenance, and in fact had a net surplus of \$5.8 million only four years after beginning operations. It has an inclusive fare policy that is based on affordability and willingness to pay, and offers a 50 per cent discount to PWDs, the elderly and students. Its revenue is supported by ancillary services such as renting out commercial, advertising and parking spaces.

→ [Case study on leveraging innovative finance through recycling](#)

→ [Case study on innovative financing for bottom-up infrastructure development](#)

### 4.2.7 Supporting transparency initiatives

Transparency and accountability are important components in ensuring successful implementation of inclusive climate-compatible infrastructure

programmes. Decision-making processes, as well as social and environmental impacts, should be made transparent to all stakeholders throughout the project life cycle. Safeguards and monitoring mechanisms should also be in place to ensure that inclusion and climate compatibility are not only planned for but effectively implemented in the project.

**Recommendation 22: Government infrastructure planning, decision-making and procurement processes should be made transparent to all stakeholders.** Decisions and information related to the social and climate-related costs and risks of government infrastructure projects should be publicly disclosed to ensure transparency and accountability in the use of public funds.<sup>231</sup> Public procurement processes should be transparent to avoid risk of corruption, which increases inequality and produces poor outcomes for intended beneficiaries.<sup>232</sup> This can be done through open data, e-procurement, professional capacity and integrity training of procurement officials, and joint transparency initiatives between governments and bidders.<sup>233</sup>

**Recommendation 23: Procurement and project implementation processes should be monitored and reported to ensure compliance with design as well as Environmental and Social Safeguards (ESS) policies.** Financiers should require the monitoring of processes and compliance with ESS policies as part of funding requirements. Designers, project managers, regulators and site inspectors can conduct announced and unannounced inspections to guard against incorrect implementation, construction inefficiencies and fraudulent practices. Where conditions allow, it is valuable to engage communities in monitoring construction work. CSOs and governments should hold project teams accountable to ensure that social and environmental impacts are minimized.

### Box 13. Improving transparency in Uganda

Transparency International Uganda<sup>234</sup> worked with stakeholders from CSOs, small and medium enterprises, and government officials to increase transparency in health procurement. CSOs and community monitors received training to monitor procurement and construction processes for health infrastructure projects.

In one project, the contractor upgrading the Butawata Health Center tried to use poor-quality bricks instead of the higher-quality materials that were specified and paid for. Community monitors were able to use their training to test the bricks. They then informed local officials, who ensured that the building materials were replaced.

**Recommendation 24: Audits, assessments and feedback mechanisms should be implemented to ensure accountability and effectiveness in delivering inclusive and climate-compatible infrastructure services.**

Governments can conduct social, environmental and accessibility audits of infrastructure assets to ensure that infrastructure projects continue to be fit for purpose. Communities can also establish feedback mechanisms and create independent assessments of project impacts through participatory evaluations, ensuring representation of different marginalized groups. These assessments can also include lessons learned to create a feedback loop for continuous improvement.



**Case study on improving community feedback mechanisms to resolve environmental issues**

# Section 5

## Conclusion

**“It takes all of us to build a world that works for all of us.”**

BRAC

Our common future will depend on how we lay down infrastructure now. The long lifespan of infrastructure can lock in patterns of development for decades to come, so it is essential to develop infrastructure that simultaneously addresses climate action and inclusive outcomes for all people.

Current efforts to address the climate change crisis and sustainable development are falling short of global targets. Based on current progress, it is projected that global warming will exceed 1.5 degrees Celsius during the 21st century. This threatens to further set back progress in achieving the SDGs, with up to an additional 132 million people at risk of falling into extreme poverty by 2030 as a result of climate change impacts.

There is an urgent need to ensure that all people have reduced vulnerability to, and improved adaptive capacity and resilience to cope with, the negative impacts of climate change, in line with the Global Goal for Adaptation. This is particularly important for marginalized populations, as they are disproportionately impacted by climate change despite being the least responsible for greenhouse gas emissions.

Developing inclusive infrastructure for climate action is therefore key for creating a better and more sustainable future for all, especially given that around 81 to 88 per cent of the global population belong to one or more social groups facing forms of marginalization and exclusion that limit their access to essential infrastructure services and adaptive capacity. These groups include women, children, youth, older people, PWDs, LGBTIQ+ people, people living in poverty, indigenous people, refugees and displaced persons.

### 5.1 Summary: An inclusive approach to infrastructure for climate action

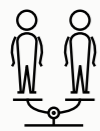
Inclusive infrastructure takes into account everyone’s diverse needs and empowers all peoples, especially the most marginalized, to have a good quality of life, be able to fully participate in society, and be more resilient to climate change impacts. It reduces the negative effects of climate change on those who are most vulnerable to it, while also equitably distributing the benefits and responsibilities of climate action.

An intersectional perspective acknowledges that vulnerability is not a result of a person’s social identity, but rather a consequence of social inequalities and systemic barriers that interact with facets of a person’s identity to create a situation of vulnerability. Developing inclusive infrastructure involves identifying, understanding and addressing these inequalities and barriers, which include physical barriers and lack of safety, prohibitive costs and requirements, discrimination and social exclusion, limited access to information, and lack of access to decision-making.



This publication presents a general view of the experiences of different social groups when it comes to the systemic barriers and climate change impacts they face, as well as their needs for different types of infrastructure services in order to be empowered and more resilient to climate change. These profiles highlight that inclusive infrastructure can mean different things for different types of people, meaning there is no one-size-fits-all approach to inclusive infrastructure.

The publication proposes five principles of inclusive infrastructure that address the systemic barriers that women and marginalized groups face when it comes to climate action and accessing essential services. Inclusive infrastructure is equitable, accessible, affordable, do-no-harm and empowering.



**Equitable** infrastructure provides fair and just access to different types of infrastructure services that can address the diverse needs of people for improved resilience and adaptive capacity to tackle climate change, countering barriers such as discrimination, social exclusion, and prohibitive costs and requirements.



**Accessible** infrastructure provides user-centric solutions for different types of people to access climate-compatible infrastructure services in an easy, safe and dignified manner. It also improves safety against gender-based and other forms of violence, addressing physical barriers, lack of safety and limited access to information through age- and gender-responsive services.



**Affordable** infrastructure increases the opportunities for people of different economic means to access good quality, sustainable and resilient infrastructure services, countering the excluding effects of prohibitive costs and requirements on adaptive capacity.



**Do-no-harm** infrastructure reduces the exposure of people and the environment to the negative impacts of infrastructure development or climate change in order to protect lives and livelihoods. It safeguards human rights, addressing physical barriers and lack of safety. It also aims to reduce bias and stigma faced by marginalized groups, addressing social barriers such as discrimination and social exclusion.



**Empowering** infrastructure 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. It addresses barriers such as limited access to information, prohibitive costs and requirements, physical barriers, lack of safety, discrimination and social exclusion.

Together, these principles comprise inclusive infrastructure that addresses the systemic barriers faced by women and marginalized communities, empowering them with better socio-economic resilience and adaptive capacity to tackle climate change.

## 5.2 Next steps: Action areas for developing inclusive infrastructure

“One of the things I think is important is moving from using the word ‘inclusion’ to ‘infiltration’. Inclusion has taken too long, so we talked about people not waiting to be invited to be included, but for people with disabilities, especially women, to simply take the lead.”

Susan Sygall, CEO and Co-Founder, MIUSA



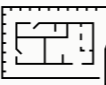

Inclusive infrastructure ensures that the most marginalized people are prioritized in infrastructure development by actively listening to their perspectives and integrating these into infrastructure policy and processes. This means that infrastructure stakeholders must commit to an inclusive and participatory process where people are not just passive beneficiaries but co-creators of their environments. This requires building trust with marginalized communities to establish an open and safe platform where they can communicate their needs and aspirations, while fostering an enabling environment of inclusive policy, institutions and governance to support the development of an inclusive and climate-compatible infrastructure system-of-systems.

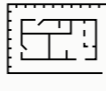




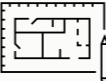

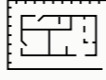





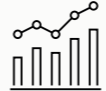

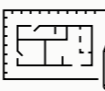



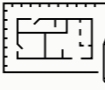


This publication proposes 7 action areas supported by 24 recommendations for developing inclusive infrastructure: mainstreaming inclusion and user empowerment, building stakeholder capacity towards inclusion, collecting people-centric data, promoting reform of institutional frameworks, planning and


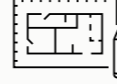



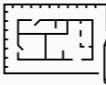

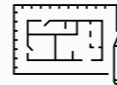



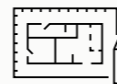
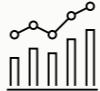



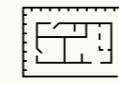


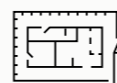


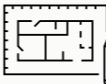


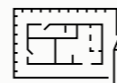


designing for all, innovating with bottom-up business models, and supporting transparency initiatives (*see Table 3*). These action areas must be supported by all stakeholders across the entire life cycle of infrastructure development.

These action areas are just the starting point towards building a more sustainable, resilient and inclusive future for everyone. There is still a large gap when it comes to data on marginalized groups, especially when factoring in intersectional needs and considerations, and an even larger gap in implementing inclusive solutions to address those needs. This publication contributes to the discourse and fills in the gap by providing a definition of inclusive infrastructure and highlighting how it can be integrated with climate action to achieve sustainable development for all.

**Table 3. Action areas and recommendations for developing inclusive and climate-compatible infrastructure**

**Stakeholders:**  Government  Financiers  Project teams and specialists  Civil society and communities

Action areas and recommendations	Stakeholders		Life cycle stage		
	Main	Support	Planning	Delivery	Management
<b>Mainstreaming inclusion and user empowerment</b>					
1. Communities should be engaged in infrastructure development to ensure equitable sharing of the benefits and responsibilities of climate action.	 	 			
2. Community-based organizations and CSOs representing marginalized groups should act as a bridge for communities to be involved in strategic planning processes and infrastructure development.		 			
3. Project teams should adopt a community-first approach using appropriate participation and consultation mechanisms.	 	 			
<b>Building stakeholder capacity towards inclusion</b>					
4. Awareness of and knowledge about inclusion need to be fostered among stakeholders to address biases against marginalized groups.	 				
5. Capacity building should be conducted to improve technical skills of stakeholders in mainstreaming inclusion and climate action in infrastructure development.	 				
6. Training and education programmes in sustainable infrastructure development should target a diverse range of participants.	 				
7. Inclusive capacity building programmes on sustainable practices within communities can help ensure effective management of infrastructure systems.	  				

Action areas and recommendations	Main	Support	Planning	Delivery	Management
<b>Collecting people-centric data</b>					
8. Disaggregated and spatially-detailed data should be integrated as a baseline to inform decisions and evaluate impacts of infrastructure development.	 				
9. Assessments such as CRVA should be conducted to determine high-priority areas for climate-compatible infrastructure development.					
10. Project teams should monitor, report and document how they mainstream inclusion and climate action within infrastructure projects, as well as conduct project impact assessments to show lessons learned.					
<b>Promoting reform of institutional frameworks</b>					
11. Legislative and regulatory frameworks need to be reformed, adopted and enforced to mainstream inclusive climate action in infrastructure development.	 	 			
12. Inclusive regulation and design standards, as well as environmental and social safeguards, should be properly enacted and enforced in all stages of infrastructure development.	 	 			
<b>Planning and designing for all</b>					
13. Infrastructure plans and governance mechanisms for implementation should take a long-term systems view toward inclusion and climate action.		  			
14. Infrastructure plans should be based on the best available people-centric data and climate science, which should be integrated at the project level into clear and feasible targets, indicators, budgets and actions.	 	 			
15. Infrastructure should be designed with inclusive and climate-compatible principles.					
16. Post-disaster recovery and reconstruction provide opportunities for inclusive and climate-compatible 'building forward better'.	 	 			

Action areas and recommendations	Main	Support	Planning	Delivery	Management
<b>Innovating with bottom-up business models</b>					
17. New business cases and models should be built to support and attract financing for mainstreaming inclusion and climate action in infrastructure services.					
18. Financiers should incorporate inclusion and climate action-related criteria in project selection and funding requirements.					
19. Governments should conduct inclusive and participatory budgeting that is responsive to gender, age and disability.					
20. Budget plans should anticipate and address, over the life cycle of the project, the long-term operations and maintenance costs required to keep infrastructure inclusive and resilient to climate impacts.					
21. Infrastructure projects can leverage innovative financing mechanisms and sustainable procurement practices to create inclusive economic impacts.					
<b>Supporting transparency initiatives</b>					
22. Government infrastructure planning, decision-making and procurement processes should be made transparent to all stakeholders.					
23. Procurement and project implementation processes should be monitored and reported to ensure compliance with design as well as ESS policies.					
24. Audits, assessments and feedback mechanisms should be implemented to ensure accountability and effectiveness in delivering inclusive and climate-compatible infrastructure services.					

Case study on community-based infrastructure delivery

## Relocation of the displaced population in the Langue de Barbarie



### Location

Langue de Barbarie, Saint-Louis, Senegal, Africa

### Duration

2018-2020

### Partners

UNOPS, World Bank, Senegal's Agence de développement municipal

### Objective

To improve living conditions for the former residents of the Langue de Barbarie who were displaced due to extreme storm surges

### Infrastructure sector

Buildings – housing

### Infrastructure life cycle stage

Delivery

### Target group

Climate refugees and internally displaced people

### Integration of inclusion measures

Local residents were hired and trained to construct new shelters. This contributed to better integration of the displaced population into the hosting neighbouring communities. It also helped the community members have a source of income and build new skills for future employment, as well as instilling a sense of ownership.

Gender inclusion was mainstreamed in the project by ensuring safe access to the site, sufficient lighting and an adequate supply of potable water to ensure the health, safety and hygiene of women and girls. Participation of a female workforce was highly encouraged and effective representation of women was targeted at each stage of the project. Women made up half of the team of leaders who installed the shelters, as well as half of the Relocation Site Management Committee. Women who lost their livelihoods due to coastal erosion were trained, and they participated in the assembly of shelter units to help them develop new skills and generate short-term income. These actions helped empower women to be economically independent and encouraged them to take leadership positions in the local communities and exercise their decision-making power.

The project also included measures to prevent GBV (particularly the separation of sanitary blocks). The development plan for the new site was reviewed to ensure safe, well-lit spaces. Discussions and exchanges on GBV were organized during community mobilization sessions to improve sensitization and educate the community on how to address and prevent it.

### Integration of climate action measures

The community was displaced because of storm surges, so the relocation site was located at a safe distance of 10 kilometres away from the sea. Transitional shelter was constructed first as rapid intervention before a more permanent settlement was built.

### Project output

Relocation of the displaced community to a new shelter site with an adequate, safe and clean environment.

### Positive outcomes and impacts

More than 400 shelters were built, providing housing to more than 1,400 people. Using shelter units, 15 classrooms have also been installed around the Diougop site so that children can continue their education.

[← Return to Section 4.2.1](#)

Case study on participatory decision-making and planning with communities

## “Let’s Build a Home Together” project with the most vulnerable Roma families in Belgrade



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### Location

Belgrade, Serbia, Europe

### Duration

2013-2016

### Partners

UNOPS, European Union, City of Belgrade, Office of the High Commissioner for Human Rights (OHCHR)

### Objectives

To enhance the living conditions and aid in income generation of vulnerable Roma families in line with international human rights standards and the legislation of the Republic of Serbia

### Infrastructure sector

Buildings – housing

### Infrastructure life cycle stages

Planning and delivery

### Target groups

Children, ethnic minorities, and women



### Integration of inclusion measures

The project was designed in line with international standards on the right to adequate housing and is based on a fully participatory model. Participatory decision-making and planning with the beneficiaries guided the project in order to create shelter solutions that were needs-responsive and culturally adaptive. Women participated actively in the decision-making process. The project team conducted a socio-economic survey of the beneficiaries to gather comprehensive information about their professional skills, education levels and work experience and the overall needs and interests of the community. The beneficiaries were also provided with reconstruction material, appliances and livelihood equipment.

### Integration of climate action measures

Multiple workshops were organized to help raise awareness of environmental issues and empower both children and adults to act in the interest of healthy and safe living.

### Project output

Durable and sustainable housing, with full tenure, for 170 families.

### Positive outcomes and impacts

The project enabled social inclusion of disadvantaged Roma families in non-Roma communities. It also provided long-term decent living conditions, freedom and security against eviction to 110 Roma beneficiary families (with a total of 512 family members) by awarding them full tenure to their homes.

[← Return to Section 4.2.1](#)

Case study on building capacity and creating green jobs

## Improving sanitation and access to disadvantaged neighbourhoods in the city of Conakry



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### Location

Kaloum, Dixinn, Matam, Matoto and Ratoma, Conakry, Guinea, Africa

### Duration

2014-2016

### Partners

UNOPS, Department of Secondary Roads of the Guinean Ministry of City and Urban Planning, European Union

### Objectives

Improve living conditions in and access to economically disadvantaged neighbourhoods

### Infrastructure sectors

Transport – roads, water – drainage, flood protection, water supply, waste management – collection and management

### Infrastructure life cycle stages

Delivery and management

### Target groups

People living in poverty, women and children

### Integration of inclusion measures

Workers were hired solely from the local communities, and were provided training and wages to help improve their economic opportunities.

The lack of transport access had been linked to infant and maternal mortality rates in the communities. Improving road conditions in the neighbourhoods helped improve access to healthcare facilities, employment opportunities, as well as police services.

### Integration of climate action measures

The project integrated climate-resilient standards into the infrastructure design, including the use of construction materials that are more resilient to floods and rain.

### Project outputs

Construction of or rehabilitation assistance for secondary and tertiary roads including roads and sidewalks, junkyards, and health infrastructure including 50 latrines, 5 laundries and 20 wells. Ten local monitoring committees were set up to help maintain the infrastructure.

### Positive outcomes and impacts

The project created more than 100,000 person-days of work, and the training received by local workers helped them achieve employment after the completion of the project.

[← Return to Section 4.2.2](#)

Case study on capacity building for participatory infrastructure management

## Sustainable waste management programme in Sri Lanka



### Location

Batticaloa and Mannar Districts, Sri Lanka, Asia

### Duration

2014-2017

### Partners

UNOPS, European Union Support to District's Development Programme (EU-SDDP), Kattankudy Urban Council, Government of Sri Lanka

### Objective

Find a long-term solution to effectively manage waste through consultations with local communities and other stakeholders

### Infrastructure sectors

Waste management, digital communications

### Infrastructure life cycle stages

Delivery and management

### Target groups

Women, youth and children

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### Integration of inclusion measures

The programme approach was to elicit help from the community by targeting and cooperating with women’s associations, youth associations, schools, etc. Women were targeted for participation and their knowledge was used to improve project planning. Women-headed families and young women were involved in making new products from waste materials.

### Integration of climate action measures

Programmes with the local community helped build their capacity in sustainable waste management, including waste segregation and the 3R concept of reduce, reuse, recycle. A modern tracking system was established with a mobile service provider to improve efficiency in the waste collection process.

### Project outputs

Developed solid waste management programmes, including an internet-based tracking system, cluster engineered landfill, waste water treatment plants, and drainage canals for flood prevention.

### Positive outcomes and impacts

Of the waste received from beneficiaries, 60 per cent was biodegradable and used to enhance compost operations; 15 per cent was recyclable and 25 per cent was residual waste of low economic value which was diverted to the landfill facility.

The project improved public services through 14,400 m of drainage lines and 3,000 trained admin and waste management workers, benefitting over 616,000 people directly and indirectly.

[← Return to Section 4.2.2](#)

Case study on integrating disaggregated data in decision-making

## Reconstruction of public structures affected by floods in Serbia



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### Location

Serbia

### Duration

2014-2016

### Partners

UNOPS, European Union, Government of Norway

### Objectives

Restore critical public infrastructure and services, build forward better and promote social cohesion

### Infrastructure sector

Buildings – public services

### Infrastructure life cycle stage

Delivery

### Target groups

Women and children

### Integration of inclusion measures

Acknowledging that inequalities become more apparent during disasters and emergencies, the project team conducted a needs survey and assessment to produce gender-disaggregated data and data on vulnerable groups for targeted areas and institutions. The data was used for the planning and design phases to ensure all reconstructed facilities would improve access for persons with reduced mobility and have PWD-accessible toilets. The refurbishment of 9 schools, a kindergarten, 8 health institutions and 4 cultural facilities in 13 municipalities in Serbia brought better access to health, education and cultural services to more than 8,500 citizens. Among them, 56 per cent of women and 59 per cent of pre-school and school children benefited directly from the project.

### Integration of climate action measures

In order to build forward better after the floods, the project applied climate-compatible principles to reduce carbon dioxide emissions and cut down the maintenance costs of local public institutions. Technical measures to improve energy efficiency were part of the reconstruction design, including replacement of joinery, new heating boilers using renewable energy sources and rehabilitation of roofs and facades.

### Project output

Rehabilitation of public buildings.

### Positive outcomes and impacts

This project allowed 220,000 citizens to resume their education, have access to healthcare and participate in community and cultural activities through the rehabilitation of 22 public buildings (accounting for 35 per cent of public buildings that needed rehabilitation).

[← Return to Section 4.2.3](#)

Case study on conducting vulnerability assessments to inform planning decisions

## Renewable energy solutions for the most affected Palestinians in Gaza



### Location

Gaza, Palestine

### Duration

2018-2019

### Partners

UNOPS, Government of Japan, Ministry of Public Works and Housing, Palestinian Energy and Natural Resources Authority (PENRA)

### Objective

Provide access to clean and reliable energy for the most affected Palestinians in Gaza, in order to support their access to essential services and economic opportunities

### Infrastructure sector

Energy – renewable electricity

### Infrastructure life cycle stages

Planning and delivery

### Target groups

Women, people living in poverty, the elderly and PWDs

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### Integration of inclusion measures

Transparent vulnerability assessments were conducted to target beneficiaries from the most vulnerable affected populations. The assessment process was initiated based on a pool of suggested beneficiaries by the Ministry of Social Development and Ministry of Public Works and Housing. UNOPS then developed a selection and evaluation template, to be verified through field visits. During the field visits to all potential beneficiaries, their vulnerability was assessed based on severity. In addition, beneficiaries whose shelters could not accommodate the interventions due to technical issues were deemed ineligible. Once all field visits were conducted, the vulnerability scores were ranked and the top 188 households were selected as beneficiaries. As a result, female- and elderly-headed households, widows with fewer means and PWDs were prioritized as project beneficiaries.

### Integration of climate action measures

Clean and reliable energy sources were provided to households through hybrid solar systems.

### Project output

Installed hybrid solar systems with a peak capacity of around 3 kilowatts on the rooftops of households across eight municipalities.

### Positive outcomes and impacts

The project is providing 1,160 people with electricity, with over 20 per cent of the beneficiary households headed by a woman or person with disabilities.

[← Return to Section 4.2.3](#)

## Case study on building inclusive institutional frameworks

# Darfur Urban Water Supply Project



### Location

El Fasher, El Geneina and El Daein, Darfur, Sudan

### Duration

2010-2014

### Partners

UNOPS, Government of Japan

### Objective

Improve access to clean water for communities in Darfur

### Infrastructure sector

Water – clean drinking water supply

### Infrastructure life cycle stage

Delivery

### Target groups

People living in poverty, women and children

### Integration of inclusion measures

By providing easily accessible clean water within the communities, the project reduced risks to women and children who are exposed to violence or sexual assault when collecting water at distant reservoirs. It also gave community members more time to engage in economic activities rather than collecting water, thus aiding in reducing time poverty.

### Integration of climate action measures

By rehabilitating existing infrastructure, the project helped reduce the potential carbon emissions from building new infrastructure.

### Project outputs

The project rehabilitated existing water supply infrastructure in El Fasher, El Geneina and El Daein. The project also developed local supplier capacity. Based on the learnings of this project, UNOPS will work with the Darfur government to develop an institutional framework to improve the successful delivery of future projects.

### Positive outcomes and impacts

The project gave 240,000 people access to clean water.

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Case study on designing for long-term resilience

## Freetown Emergency Recovery Project: Slope stabilization, remediation and rehabilitation works



### Location

Mortormeh, Regent, Sierra Leone, Africa

### Duration

2018-2019

### Partners

UNOPS, Government of Sierra Leone, World Bank, UK Department for International Development (DFID)

### Objective

Improve resilience of the local community to landslides and flooding risks on Sugarloaf Mountain after the August 2017 landslide

### Infrastructure sector

Protective infrastructure – landslide and flood protection

### Infrastructure life cycle stages

Delivery and management

### Target groups

Women, youth and PWDs

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### Integration of inclusion measures

Skilled and unskilled job opportunities were created for locals, including adapted job roles for PWDs.

### Integration of climate action measures

The project team conducted surveys and analysis of the landslide area to advise the government on the severity and impact of potential disasters and the residual risks to people living in disaster-prone areas near the site. The project used nature-based solutions to improve resilience against landslide and flooding risks, including planting 7,500 native rainforest trees in the affected area. An on-site seed nursery is also being used to grow 21,000 trees to further revegetate Sugarloaf Mountain to stabilize the soil. Further, local community members were trained in forestry and tree husbandry to plant and maintain trees in the affected area. The project also reused rocks and debris as construction material, thus reducing potential carbon emissions from sourcing of material.

### Project outputs

The project improved the resilience of the local communities to landslide and flood risks by moving 200,000 tons of debris, recreating five watercourses and revegetating the site to stabilize the soil. It also created local employment opportunities targeting the most vulnerable groups affected by the landslide.

### Positive outcomes and impacts

Providing job opportunities for locals helped support economic recovery for those most affected by the landslide. Further, the plants being grown to revegetate the area can provide fruit, nuts, seeds, kernels and leaves that can be used for food, medicine and as a source of income.

[← Return to Section 4.2.5](#)

Case study on applying gender- and disability-responsive principles in reconstruction

## Modernization and improvement of policing project in Nepal (MIPP)



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### Location

Nepal, Asia

### Duration

2015-2021

### Partners

UNOPS, United Kingdom Foreign, Commonwealth & Development Office (FCDO), Government of Nepal

### Objective

To strengthen access to security and justice for the most vulnerable people, particularly women, children and other traditionally marginalized people

### Infrastructure sector

Buildings – public institutions

### Infrastructure life cycle stages

Planning and delivery

### Target groups

People living in poverty, women, children and LGBTIQ+ people

### Integration of inclusion measures

The project conducted a participatory selection of police units to prioritize services to marginalized and remote communities. Systematic community engagement was done prior to, during and after construction to ensure inclusive infrastructure development.

The design and operational planning of the units integrated the community's inputs as well as a gender and disability lens. This led to gender-sensitive and PWD-friendly building design, including special rooms for cases of GBV and counselling of women, children and transgender people.

Locals and members of marginalized communities were prioritized when hiring. Female labourers were encouraged to participate in the construction process through wage incentives, and were assigned to women-only working groups to ensure their safety and meet their needs.

### Integration of climate action measures

After earthquakes in 2015, the project aimed to build forward better police infrastructure with a reduced climate footprint by maximizing local construction materials and labour. Operations and maintenance training for building sustainability was also conducted to ensure long-term sustainability.

### Project output

Rebuilding and improving police infrastructure.

### Positive outcomes and impacts

Constructed 58 gender- and disability-friendly facilities for Nepal Police.

[← Return to Section 4.2.5](#)

Case study on leveraging innovative finance mechanisms through recycling

## Sixaola binational bridge



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### Location

Sixaola, Costa Rica, and Guabito, Panama, Latin America

### Duration

2015-2022

### Partners

Mexican Agency for International Development Cooperation, Government of Costa Rica, Government of Panama

### Objective

Improve transport between Costa Rica and Panama, promoting economic opportunities for the people of Sixaola and Guabito

### Infrastructure sector

Transport – bridges

### Infrastructure life cycle stages

Planning and delivery

### Target groups

Indigenous populations, disadvantaged communities, migrants and Afro-descendants



### Integration of inclusion measures

The bridge serves to connect and improve economic opportunities for a total of 15,000 inhabitants in the neighbouring towns of Guabito and Sixaola. In these towns, there is a large presence of indigenous peoples, people of African descent and migrant settlers related to the banana industry, all of whom have socio-economic indicators well below the national averages.

Consultation and dialogue with the Ngäbe-Buglé indigenous community led to the development of a new embankment along the river for personal hygiene and washing, where 100 women go every morning to wash and socialize as part of their traditional customs.

### Integration of climate action measures

The bridge was designed with differentiated areas for pedestrians and cyclists, seismic isolators and intelligent photovoltaic lighting. The money earned from selling material from the old railway bridge was used to renovate Sixaola's municipal market.

### Project outputs

Construction of a new binational bridge between Costa Rica and Panama, decommissioning of the former railway bridge, and design of the surrounding binational park area.



### Positive outcomes and impacts

The construction of the new bridge created 250 jobs for workers on both sides of the border.

[← Return to Section 4.2.6](#)

Case study on innovative financing for bottom-up infrastructure development

## Community Upgrading Fund in Greater Monrovia



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### Location

Greater Monrovia, Liberia, Africa

### Duration

2019-2021

### Partners

Cities Alliance, Ministry of Internal Affairs of Liberia, Paynesville City Corporation, Monrovia City Corporation, Slum Dwellers International, Young Men's Christian Association, Federation of Liberia Urban Poor Savers

### Objectives

The project aimed to address enormous backlogs in essential services such as water, sanitation and education and enhance climate resilience against floods and mudslides in Greater Monrovia

### Infrastructure sectors

Water, sanitation, buildings – schools

### Infrastructure life cycle stages

Planning, delivery and management

### Target groups

People living in informal communities, children, women and girls, and the elderly

### Integration of inclusion measures

There was a focus on localizing the SDGs in the most neglected areas of the city and involving women, older people and the youth in the design process of infrastructure systems.

### Integration of climate action measures

Capacity building for local government officials and partner organizations included a trip to Ghana to learn about context-applicable and sustainable solutions such as bio-digesting toilets. This was then piloted in Monrovia with the possibility of scaling up in other areas.

### Project outputs

Community Upgrading Fund (CUF) is a bottom-up mechanism that enhances community engagement as well as ownership of the design and implementation of small infrastructure projects. It includes the creation of an institutionalized platform for stakeholder cooperation, participatory decision-making and consensus building processes, and establishment of pooled funds to support community-led projects. It is anchored around a locally replicable people-centred governance framework, which allows targeted funding to be easily leveraged. Funds are supplemented through revenue from water kiosks, sanitation facilities, the sport field and community town halls built through the CUF.

The CUF reached at least 100 communities through community-based small infrastructure projects with approximately up to 350,000 beneficiaries. Projects include providing 110 community water kiosks, 6 toilet and shower facilities, 2 kindergarten school blocks, and fencing for 3 schools to create a safe learning environment. In addition, 100 water points and 4 community water storage tanks were restored or improved. Activities also include capacity building in water management, sanitation and hygiene for local government officials and communities.



### Positive outcomes and impacts

The installation of multiple water points improved access to water for persons with disabilities in the community. The reduction in time children spent collecting water helped improve school attendance. The project enabled access to urban services and encouraged economic empowerment in the urban space, especially for women and the youth.

[← Return to Section 4.2.6](#)

Case study on improving community feedback mechanisms to resolve environmental issues

## Puerto Viejo sanitary sewer system



### Location

Puerto Viejo, Limón, Costa Rica

### Duration

2015-2023

### Partners

UNOPS, Costa Rican Institute of Aqueducts and Sewers (AyA)

### Objective

Improve the sanitation system in Puerto Viejo

### Infrastructure sector

Sanitation

### Infrastructure life cycle stage

Delivery

### Target groups

Youth, women, migrants and Afro-descendants

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### Integration of inclusion measures

Environmental concerns are shared directly and continuously with community leaders, and the project strengthened community capacities to address these concerns and propose consensual solutions.

Up to 60 per cent of staff are hired from local communities, including the Afro-descendant population and women.

Safety for women and all people was promoted with zero tolerance for street harassment through awareness-raising activities and the establishment of channels for receiving complaints based on a care protocol.

Complementary actions for environmental and social sustainability were undertaken with local youth, civil society, the municipality of Talamanca and the working people of the region. The project team worked closely with 30 young people with the initiative Ambassadors of the Sea, enhancing their capacities in coral conservation, entrepreneurship, communication and diving.

### Integration of climate action measures

The project aims to mitigate groundwater contamination. Active community participation was encouraged for protecting the environment, including the care and recovery of reefs and cleaning of the seabed and beaches.

### Project output

Design and construction of the sanitary sewer system and treatment plant of Puerto Viejo, Limón.

### Positive outcomes and impacts

The project provides direct benefits to more than 4,500 people in a coastal area with great tourist potential and significant challenges in terms of human development.

Thirty young people received training to contribute to their environmental conservation skills, economic empowerment and social recognition. They received training in the Professional Association of Diving Instructors divemaster certification course (7), basic boat training (6), underwater archaeology (24), coral monitoring (23), entrepreneurship (24) and communications (25).

[← Return to Section 4.2.7](#)

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