Inclusiveness in Sustainable Infrastructure and the Nexus with the Environment

A Thematic Paper for UNEP and the Sustainable Infrastructure Partnership

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1. Introduction

Today's discourse on economic growth, development and infrastructure often makes generous use of terms like 'inclusion,' 'inclusive,' 'inclusiveness' and 'inclusivity',[1] as in inclusive economic growth, inclusive development, inclusive infrastructure, inclusive decision-making, inclusive communities, and so on. The idea of inclusion is sprinkled liberally in the Sustainable Development Goals and Targets, such as 'inclusive and sustainable economic growth' (Goal 8), 'inclusive and sustainable industrialization' (Target 9.2), 'social, economic and political inclusion of all' (Target 10.2), 'inclusive, safe, resilient and sustainable' cities (Goal 11), and 'just, peaceful and inclusive societies' (Goal 16). Other frequent references to inclusion in the context of SDGs are inclusive education (in relation to Goal 4) and inclusive partnerships (in relation to Goal 17). Curiously, Target 9.1 on infrastructure mentions 'quality, reliable, sustainable and resilient infrastructure' without the word 'inclusive'.

Inclusion and its related words soften the harder edge of the economic and financial angles of the discourse and are favored by international organizations, politicians and decision makers alike. Inclusion also serves as a more pliable alternative to using the human rights and discrimination language that is rooted in hard law. But despite the popularity of these terms, officials do not seem to know what they mean, let alone how to implement the concept in infrastructure development. Even experts have a hard time separating the idea of inclusion from sustainability from time to time.

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[1] According to one source (WikiDiff, available at: https://wikidiff.com/node/558514 (accessed on 13 April 2020), the word inclusivity is a nonstandard buzzword, which seems to have originated around the turn of the 21st century, and is equivalent to inclusiveness. Inclusiveness is the property of being inclusive. This paper uses the term 'inclusiveness' instead of 'inclusivity'.

The plainest meaning of inclusion is the absence of exclusion or discrimination. However, there is no universally authoritative definition of the term 'inclusion' or 'inclusiveness' in the context of infrastructure development. Because the term is often used in conjunction with 'sustainable,' the boundary between inclusiveness and sustainability is often blurred. Considering the importance of inclusiveness in sustainable infrastructure, and to inform UNEP and the Sustainable Infrastructure Partnership (SIP)[2] in the process of developing a set of sustainable infrastructure Principles and Guidance, and to help engage with the participants and stakeholders in this SIP process, UNEP commissioned this thematic paper as a knowledge product of the SIP.

This paper explores the meaning of inclusiveness in infrastructure, how inclusiveness interacts with environmental sustainability, and how it is or can be integrated in infrastructure. The paper benefited from a desk review of available literature on inclusiveness in infrastructure, with a focus on practice-oriented sources, such as publications of international, regional and national organizations, as opposed to pure academic sources. Because the term 'inclusive infrastructure' is perceived as an imprecise and amorphous term, and because achieving inclusiveness involves multiple thematic areas and disciplines, such as human rights, social impact assessments, spatial planning, and urban development, this paper also sought guidance from some recent published works in these areas and disciplines. In addition, this paper benefited from the November 2019 multistakeolder workshop convened by UNEP and UNOPS on sustainable infrastructure (the Workshop), which identified issues and potential solutions. The paper takes account of these inputs and concludes with some observations about how we can work together to overcome obstacles and achieve inclusiveness and sustainability in infrastructure.

2. What is inclusiveness in infrastructure?

a. Core literature

By far, the most thorough treatment of the topic of inclusive infrastructure is given in *Inclusive Infrastructure and Social Equity*, a publication of the Global Infrastructure Hub (GI Hub) and Atkins Acuity (Global Infrastructure Hub 2018). It is a practical resource to benefit government officials in their decision-making, and contains detailed advice on implementing inclusiveness in infrastructure in six 'action areas.'[3] Case studies from around the world illustrates the action areas. This paper also relied on another key publication, which is *Guidelines for developing eco-efficient and socially inclusive infrastructure* (UNESCAP 2011). It focuses on ways in which cities can adopt eco-efficient infrastructure by engaging in an inclusive planning process. It describes strategic and procedural steps required for such planning process to achieve eco-efficient infrastructure, also with case studies from cities around the world illustrating their approaches to inclusiveness.

Global Infrastructure Hub (2018) is also valuable for its reference list that refers to 64 works on inclusive infrastructure, many of which are by international, regional and national organizations, and includes sectoral and thematic resources, some general and some region-specific, up to the year 2018. These referenced resources themselves have reference or literature lists which also contribute to the body of

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[2] See: https://www.unenvironment.org/explore-topics/green-economy/what-we-do/economic-and-fiscal-policy/sustainable-infrastructure (accessed on 13 April 2020).
[3] These are: (i) stakeholder identification, engagement and empowerment; (ii) governance and capacity building; (iii) policy regulation and standards; (iv) project planning, development and delivery; (v) private sector roles and participation; and (vi) affordability and optimising finance.

literature. For example, the 2016 version of the rapid desk-based literature review on the topic of infrastructure and inclusion by the Institute of Development Studies' Knowledge, Evidence and Learning for Development Programme (K4D) (Raje (2016)) also contains a good list of references.

The GI Hub also recently inaugurated a very comprehensive Quality Infrastructure Investment Database, with close to 500 resource materials, some of which relates to inclusion (Global Infrastructure Hub 2019).

The notable sources that informed this paper are listed in Annex A.

b. What does inclusiveness mean?

'Inclusion' and 'social inclusion' are big ideas. An UNDESA publication by Atkinson and Marlier (2010) defines social inclusion as the process by which societies combat poverty and social exclusion: '"Social exclusion" is defined here as the involuntary exclusion of individuals and groups from society's political, economic and societal processes, which prevents their full participation in the society in which they live. "Poverty" is defined as the lack of economic resources, and so defined, is an important cause of social exclusion in as much as the lack of those resources prevents participation.' The World Bank defines social inclusion as the process of improving the ability, opportunity and dignity of people, disadvantaged on the basis of their identity, to take part in society (World Bank 2013).

What does inclusion or inclusiveness mean in the context of infrastructure? Building on the broad idea of social inclusion above, inclusiveness in infrastructure ensures valuable services and benefits for all individuals, communities and social groups, with a special attention to the vulnerable and the marginalized, who are the core beneficiaries at the heart of the discourse. As stated by Global Infrastructure Hub (2018) and K4D (Raje (2016)), inclusive infrastructure does not leave anyone behind. Commonly mentioned vulnerable groups include children, youth, women, older persons, economically disadvantaged persons, persons with disabilities, and indigenous peoples. Also mentioned are pregnant women, people living with HIV, refugees, internally displaced persons and migrants as well as job-seekers and unemployed persons. Although expected social benefits from inclusive infrastructure should prioritize these vulnerable and marginalized groups, inclusive infrastructure should also advantage the population at large through enhanced quality in infrastructure service delivery.

Notwithstanding these core elements of inclusiveness, different functions and nuances of inclusiveness are captured by various publications. Some consider inclusiveness as an element of decision-making, while others focus on inclusiveness as an outcome of decisions. For instance, Global Infrastructure Hub (2018) offers a pithy and functional definition of inclusiveness: Inclusiveness is a means to enhance the economic participation and social inclusion of all and to address inequality. This definition complements the G20 mission on economic growth, and the new G20's Principles for Quality Infrastructure Investment (QII Principles – see below). Elsewhere, GI Hub defines inclusive infrastructure as: Any infrastructure development that enhances positive outcomes in social inclusivity and ensures no individual, community, or social group is left behind or prevented from benefiting from improved infrastructure. The GI Hub explains that the dimension of social and demographic inclusion and related positive outcomes are the core pillars of the inclusive infrastructure concept. And it makes explicit mention of inequality, which is now broadly recognized as a serious barrier to maintaining a productive society, social inclusion, social stability, and sustainable growth. It also mentions that social inclusivity is integral to the SDGs.

A more utilitarian meaning of inclusiveness is offered by UNESCAP (2011). According to this publication, 'inclusive' in the context of infrastructure planning and decision-making processes means including a broad range of people from across a city, from experts to ordinary residents, with the aim of considering their inputs and reaching mutual agreement. It refers to treating all people in a city equally in their access to work and services, such as public transport and health care. Here, the focus is especially on inclusiveness as a process means to achieve an eco-efficiency end in the urban setting, in view of 'urbanization of poverty' and cities' huge ecological footprint: Cities occupy 3% of the Earth's land surface, yet house half of the human population, use 75% of the resources and account for approximately 70% of the CO_2 emissions (UNESCAP 2011). This publication provides an excellent description of the inclusive and consultative process and its outcome, which is eco-efficient and inclusive infrastructure. It supports the idea that inclusiveness can advance environmentally sustainable infrastructure.

The QII Principles, endorsed by the Osaka G20 Summit in 2019, after the GI Hub publication, underscore the positive impact of infrastructure and encourage the integration of environmental and social considerations in infrastructure. Parts of Principle 5 offer:

> *Infrastructure should be inclusive, enabling the economic participation and social inclusion of all.* Economic and social impacts should be considered as an important component when assessing the quality of infrastructure investment, and should be managed systematically throughout the project life-cycle.

> 5.1 Open access to infrastructure services should be secured in a non-discriminatory manner for society. This is best achieved though meaningful consultation and *inclusive decision-making* with affected communities throughout the project life cycle, with a view to securing non-discriminatory access to users.

> 5.2 *Practices of inclusiveness should be mainstreamed throughout the project life cycle. Design, delivery, and management of infrastructure should respect human rights and the needs of all people*, especially those who may experience particular vulnerabilities, including women, children, displaced communities or individuals, those with disabilities, indigenous groups, and poor and marginalized populations. (Author's italics.)

The foregoing expression of inclusiveness was endorsed by all the G20 leaders in June of 2019, and as a result it is by far the most politically influential one on the topic. It is quite rare to see human rights referred in high level G20 documents (other than labor or women's rights), and this did not escape the attention of human rights advocates. There is the added bonus of references to ecosystems and biodiversity (not to mention the succinct but well-structured Principles 6 on economic governance in infrastructure), which makes the QII Principles a potentially universal point of reference for advocates of sustainable infrastructure (even though the Principles score poorly on the climate change front). As a result, some believe that the QII Principles could potentially act as an overall reference point or 'touchstone' for environmental, social and governance dimensions of quality and sustainable infrastructure, as further discussed below.

Inclusiveness is realized through transparency and stakeholder identification and engagement. Tools to facilitate these process outcomes include various analyses, audits and assessments focused on beneficiaries, participatory planning, co-design, universal design, etc. UNESCAP (2011) has an extensive

list of these tools to draw people into the inclusive planning process. Global Infrastructure Hub (2018), K4D, Baldwin (2018) and many others also consistently refer to transparency and participation. This point was vividly underscored by Dr Stephanie Hirmer of Cambridge University, who spoke at the Workshop about her User-Perceived Value (UPV) approach, which aims to meet users' priorities in infrastructure development.[4] On the other hand, even though the principle of accountability usually goes along with transparency and participation principles (these are both governance and human rights principles), the publications consulted for this paper hardly mentions accountability.

3. What is the nexus of inclusiveness and environmental sustainability?

Participants in the Workshop noted the seemingly fuzzy boundary between inclusiveness and sustainability. On this, Global Infrastructure Hub (2018) notes:

> Much of the current literature refers to "inclusive and sustainable" infrastructure in one breath. The two terms are, of course, closely linked, but there is a need to better distinguish and define the relationship between inclusivity and sustainability. Sustainability deals with challenges such as environmental impacts, climate change, and disaster resilience, which, in many instances, disproportionately affect vulnerable groups of people. Accordingly, addressing these issues as part of the wider inclusivity agenda can help to ensure that vulnerable segments of the population are identified, and appropriate mitigation measures are put in place.

It is a slightly curious statement that sustainability deals only with environmental and climate challenges. Other publications treat inclusiveness under the broad umbrella of the three dimensions of sustainability - environmental, social and economic sustainability - and stress the need for an integrated and multidisciplinary approach in implementation (e.g., IDB (2018), OECD (2019)). This paper is aligned with this view that inclusivity is closely related to all three dimensions of sustainability. But how exactly are inclusiveness and environmental sustainability related? The relationship is a surprisingly intricate one. Below this paper seeks to unpack the nature of the nexus.

a. Vulnerability due to environmental conditions

Much of the literature on inclusiveness is focused on reducing or eliminating exclusion due to vulnerability on the basis of an individual's or a group's identity, or circumstances or conditions, which may be temporary or otherwise. The high-level definition of inclusion and the list of core beneficiary groups, described above, do not always explicitly refer to people who live in deteriorating environmental conditions, or those who depend on fast-depleting natural resources. But it can be argued that these groups are prone to economic disadvantages and consequent exclusion. And environmental vulnerability is often illustrated in case studies on inclusiveness (e.g., UNESCAP (2011), K4D (2018)). Hence, people subjected to environmental vulnerability are undoubtedly part of the vulnerable groups meant to be addressed by inclusive infrastructure, whether explicitly defined as a vulnerable group or not.

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[4] See the summary of discussions at the Workshop, available at:
https://greengrowthknowledge.org/sites/default/files/uploads/Workshop%20Summary%20Report_Inclusive%20Infrastructure_14-15%20November%202019.pdf (accessed on 13 April 2020).

The following example from UNEP (2019) illustrates an opportunity to apply such a wider inclusiveness agenda in complex transport infrastructure planning in Myanmar, and potentially tackle environmental vulnerability in the process:

> Myanmar is in a strategic location for accessing several important economic corridors. There are currently proposals in place to implement road and port projects across the country, all of which present both opportunities and risks to the country's people and natural environment (WWF, 2017).

> The coordinated planning of different projects can ensure that socio-economic benefits, such as increased domestic and international connectivity, improved access to jobs, education and health, and increased economic productivity are jointly achieved (Ibid., 2017). However, the proposed projects also involve the reduction of natural capital that could increase the risks of landslides, water pollution, and flooding. The proposed road corridors intercept parts of the Ayeyarwady River Basin, home to around 24 million people who rely on critical ecosystem services such as the filtration of drinking water and mitigation of the impacts of natural disasters (Ibid., 2017). Proper planning will be essential to mitigating these potential environmental impacts.

    b. Inclusiveness supporting environmental sustainability, and vice-versa

An inclusive approach to infrastructure design, construction and operation is an important means to ensuring an inclusive and sustainable outcome, including environmental sustainability. It is also true that that inclusiveness can be enabled by environmental sustainability. There are other more nuanced interactions between inclusiveness in infrastructure and environmental sustainability. However way we look at this nexus, it is a mutually supportive one.

As already mentioned, UNESCAP (2011) advocates for inclusiveness in infrastructure through an inclusive planning and decision-making process, which can ensure that eco-efficient infrastructure solutions will be based on durable consensus within the relevant communities. According to this way of thinking, inclusiveness can be an end in and of itself, but its value is primarily appreciated as a means to an end, which is eco-efficiency and environmental sustainability.

A flip side of this relationship was explored by participants during the November 2019 Workshop on Sustainable Infrastructure. As an example, an ILO representative spoke about nature-based solutions, such as use of bamboo and other natural materials in construction, which can also benefit communities by creating new jobs. At the same time, some felt that these solutions are likely to be small in scale and not always easy to scale up for greater impacts across society.

In a similar vein, it is also useful to examine the possibilities of jobs that contribute to environmental sustainability. This may occur in the case of green infrastructure initiatives that generate green jobs. ILO has been steadfastly advocating for green jobs, defined as "'decent jobs that contribute to preserve or restore the environment', be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency, benefiting both people

and the environment."[5] In these cases, it is difficult to determine whether environmental sustainability is driven by a measure of inclusiveness – job creation – or environmentally sustainable projects, such as green infrastructure, are driving inclusiveness through green jobs. But the nexus exists and it is generally a close and mutually beneficial one.[6]

Some literature takes the view that environmental, climate change and resilience orientation can promote inclusion, just as much as through a vulnerability and poverty orientation. Inclusiveness discussion through these thematic areas can enable the environmental and climate change disciplines to also embed inclusiveness in their contributions, such as community based urban development (Baldwin 2018).

A different aspect of environmental sustainability that can support inclusion is the issue of environmental justice and rights (Eames (2006)). The idea of environmental justice has several components. The US Environmental Protection Agency describes environmental justice as:

> the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys:
>
> - the same degree of protection from environmental and health hazards, and
> - equal access to the decision-making process to have a healthy environment in which to live, learn, and work.[7]

The connection between environmental justice and inclusive infrastructure may seem tenuous but the point to note is that often the poorest, most deprived, vulnerable and socially excluded communities experience the greatest environmental inequalities with the least access to environmental goods and services, affecting their quality of life (Eames (2006)). Restoring ecosystem services for such communities, for example, can enhance their social inclusion and access to opportunities. Restoration can be achieved as standalone projects, but it is when ecosystem services components are systematically integrated into economic infrastructure planning and implementation that scaling opportunities arise. Whether in energy, transport or water projects, consideration of environmental justice spares these communities from having to bear a disproportionate burden of infrastructure development, such as direct exposure to increased pollution, deterioration of environmental services, and deprivation of opportunity to access new infrastructure services. This idea of environmental justice is closely related to environmental rights, explained below.

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[5] Such jobs help to improve energy and raw materials efficiency; limit greenhouse gas emissions; minimize waste and pollution; protect and restore ecosystems; and support adaptation to the effects of climate change. See: https://www.ilo.org/global/topics/dw4sd/themes/green-jobs/lang--en/index.htm (accessed on 13 April 2020)
[6] It should not be forgotten that some infrastructure that is labelled 'green' or 'sustainable' is not automatically inclusive. See the instances of negative human rights impacts arising from renewable energy projects documented by the Business and Human Rights Resources Center. Examples of such negative impacts include poor community consultations, and failure to observe rights of indigenous peoples. It also states that UN Clean Development Mechanism does not guarantee against human rights abuses. Available at: https://www.business-humanrights.org/en/towards-responsible-renewable-energy (accessed on 13 April 2020).
[7] https://www.epa.gov/environmentaljustice (accessed on 13 April 2020).

c. International human rights and environmental Framework as a touchstone

Literature on inclusiveness in infrastructure for the most part does not make a connection between inclusiveness and the existing international human rights and environmental framework consisting of international agreements and declarations.[8] Since inclusion is the state lacking discrimination or exclusion, the international human rights framework is a natural and compelling point of reference for articulating the idea of inclusive infrastructure. In fact, the framework provides the broadest frame of reference for inclusion as well as rights underpinnings for a multitude of impacts associated with infrastructure development providing 'guardrails and guidelines' for project implementation, and ensuring environmental sustainability (OHCHR & Heinrich Böll Stiftung (2018)).

The international human rights and environmental framework plays several useful roles. First, they play a 'guardrails' function by emphasizing the need to avoid or minimize negative impacts on people and the environment. Infrastructure development may create, perpetuate or exacerbate environmental and social harm in multiple ways and at community, consumers, and societal levels (OHCHR & Heinrich Böll Stiftung (2018)). Take a thermal power plant project as an example: it needs abundant cooling water, which can deprive communities of their scarce water source or sources of livelihood and worsen their quality of life. It can reinforce ongoing exclusion, such as excluding currently unserved communities from accessing generated power, and potentially further exclusion, or even create entirely newly excluded groups as a result of infrastructure, such as households being resettled to remote sites and losing access to schools, employment, services and community. These negative impacts correlate to the human right to water, right to adequate standards of living including housing, right to work, rights to health and education, and so on.

The inclusiveness literature reviewed for this paper generally do not prioritize avoidance of harm that can lead to exclusion, and lacks mention of tools available to avoid environmental and social harm, such as the safeguard policies of multilateral development banks (MDBs) or the Equator Principles. These tools help to prevent instances of existing or new exclusion, and to support environmental and human rights.[9] GI Hub makes clear that safeguards are not the focus of the paper but briefly acknowledges their importance, whereas the point is made very clearly by IDB, K4D and the OECD. One point to note, however, is that the safeguard policies address negative impacts on affected communities but not the impacts on consumers or end-users of infrastructure services. Another tool worth noting is human rights due diligence, which is a process of inquiry that uses the international human rights (and environmental)

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[8] The key international instruments in this area include the International Covenant on Economic, Social and Cultural Rights, the International Covenant on Civil and Political Rights, Convention on the Elimination of All Forms of Racial Discrimination, Convention on the Elimination of All Forms of Discrimination against Women, Convention on the Rights of the Child, the UN Principles for Older Persons, Convention on the Rights of Persons with Disability, the UN Declaration on the Rights of Indigenous Peoples, among others. They provide legal standards for non-discrimination under international law, and for virtually all countries, under domestic law as well. Global Infrastructure Hub (2018) includes a one-page table that summarizes some of these instruments as 'international documents promoting inclusivity principles.' (However, none of these instruments mentions inclusion or similar words in the text.)

[9] It should also be noted that these safeguards are perceived as onerous by some stakeholders, and are of somewhat limited application, in that they are mostly used by MDBs in connection with development finance or by international banks that are signatories to the Equator Principles, and are invoked relatively downstream of the project cycle.

framework as a basis of assessment. The rights of consumers will be addressed under such due diligence.

The concept of environmental justice discussed above is related to the environmental rights movement within the human rights community, and is most prominently captured in the work of the UN Special Rapporteur on human rights and the environment. More specifically, the Framework Principles on the Environment and Human Rights[10] articulate the connection between human rights and the environment and climate change. Among the ten principles in the Framework Principles is Principle 3: States should prohibit discrimination and ensure equal and effective protection against discrimination in relation to the enjoyment of a safe, clean, healthy and sustainable environment. This statement provides a clear basis for the avoidance of environmental exclusion and vulnerability as part of inclusiveness and supports the goal of inclusion in infrastructure through environmental protection. Of the multilateral environmental treaties, it is perhaps the Paris Agreement that is most explicit about the linkage between climate change and human rights and the exclusionary effects of climate change.

The international human rights framework provides clear and appropriate standards for not only defining but also responding to various states of vulnerability. This is the 'guidelines' function of human rights. Concepts such as accessibility, affordability, adequacy, quality of infrastructure service are found in the International Convention on Economic, Social and Cultural Rights (especially with respect to education, health, and water) and are important in the articulation of how inclusiveness should be achieved in service provision. Other human rights instruments[11] also provide advice on what states must do to avoid discrimination. In addition, the human rights framework provides a legal basis for protecting human rights and environmental defenders, who are threatened, criminalized or even murdered for expressing their opinions about infrastructure projects.

4. The tangible characteristics of inclusive infrastructure

With all the talk of inclusiveness in infrastructure, we should be able to observe visible shifts in the characteristics of infrastructure that benefit users, which in turn may enhance the way in which people value and appreciate infrastructure benefits. Without such shifts, inclusiveness in infrastructure will only be a conceptual exercise on paper. To be sure, we can already witness a degree of maturation and sophistication in the way universal design or barrier-free design is implemented in some infrastructure, signaling enhanced aesthetics, equity and well-being of people with disabilities; furthermore, such designs benefit all users of infrastructure, especially the older population whose numbers continue to grow in developed countries. This is one example of a visible shift toward improved inclusiveness in infrastructure. But inclusiveness should reflect the diversity of needs of all vulnerable groups, communities, and the population at large, and should be manifested in different designs and functions in both obvious and subtle ways. Ultimately, success or failure of the efforts to embed inclusiveness in infrastructure should be judged in part by whether a balanced mix of economic and social infrastructure will be offered to the population at large for maximum benefits.

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[10] A full list of the international instruments is available at: https://www.ohchr.org/Documents/Issues/Environment/SREnvironment/FrameworkPrinciplesUserFriendlyVersion.pdf (accessed on 30 April 2020).
[11] Ibid.

An increasing number of studies show that women's infrastructure needs are different from those of men.[12] Take transportation for example. Transportation projects designed primarily for commuters – many of whom are men - who move from suburbs to city centers, then back to suburbs, do not always reflect women's travel patterns. Women tend to take more trips and more complex ones compared to men, reflecting their domestic and caregiving roles (World Bank 2010). Diverse routing options, as well as personal safety considerations, identified in consultation with women, can address women's needs, which in turn will encourage more women to travel. Similarly, older persons will use infrastructure differently from younger persons, and indigenous peoples may perceive infrastructure services aimed for the mainstream population as lacking in dignity or cultural appropriateness.[13] These diverse needs can easily be identified during a process of consultation that are designed to solicit their concerns and preferences. Deliberate modification in infrastructure design to meet these needs is a key indication that inclusiveness in infrastructure is working.

We can witness another physical sign of inclusiveness in infrastructure in the 'last mile' of infrastructure that must be laid out in order to deliver services to difficult-to-reach or poor consumers. There are many cases of water and power projects that benefit well-off city residents but bypass rural or poor communities. Even though such installations are vital for service delivery to those without adequate service, the 'last mile' segment could easily be the most expensive or technically challenging part of infrastructure construction. The literature consulted for this paper recognizes the pressing need to address the 'last mile" challenge in inclusive economic infrastructure. Global Infrastructure Hub (2018, at 83) features a GIZ publication entitled *Closing the Last Mile for Millions*, which documented a project that created multiple components to overcome the challenge of the last mile in the water sector, such as sector and policy frameworks, information systems to manage scaling-up, dedicated funding mechanisms, and regulatory oversight. These efforts can lead to physical changes in infrastructure to ensure service delivery to those unserved or underserved, and provide valuable insights for others to follow. Similar examples exist in the energy sector.

For the mainstream population, the shifts may come in different ways. One analysis sets forth a broader, holistic definition and appreciation of infrastructure and an approach to local infrastructure: A broader and more integrated approach that considers the whole infrastructure system from physical components through to the services it provides is essential to unlock new opportunities for business model innovation and capturing economic, social and environmental value (iBuild 2018). For inclusive infrastructure to benefit everyone, it must systematically look for opportunities to realize environmental social and economic co-benefits,[14] which could range from job creation, enhancement of ecosystem services, business opportunities for SMEs, to creation of public services, public spaces, and amenities that benefit the overall population, in consultation with citizens. These efforts can also influence the physical shapes of infrastructure.

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[12] In fact, the OECD (n.d.) stated that inclusive infrastructure should be achieved through integrating a gender-sustainability perspective into infrastructure strategies, policies, and projects, in addition to a focus on vulnerable groups such as minorities, indigenous groups, and persons with disabilities.

[13] For instance, see the example of exclusion of indigenous women by health clinics, described in World Bank (2013), Box 2.2.

[14] Brauch (2017). *Contracts for Sustainable Infrastructure*: *Ensuring the economic, social and environmental co-benefits of infrastructure investment projects.* IISD. Available at: https://www.iisd.org/library/contracts-sustainable-infrastructure-ensuring-economic-social-and-environmental-co-benefits (accessed on 1 May 2020).

Public authorities are under increasing pressure to forge a decarbonization path for the future and must prioritize infrastructure consistent with the Paris Agreement objectives and afford it within a limited budget envelope (World Bank 2019)). However, as stated in Baldwin (2018), even in infrastructure decisions driven by climate change imperatives, inclusiveness considerations have a place and the right decisions will benefit communities for decades to come.

Ultimately, inclusiveness in infrastructure at the highest level should mean the right mix of infrastructure that benefit the population at large. Some of these will be in the social sectors, such in education, health, housing and other related sectors. There is no magic formula to achieve this balanced mix. Literature consulted for this paper does not shed light on how countries should prioritize and select social and economic infrastructure projects in order to help them choose the right projects for inclusiveness at the outset. While there may be rough benchmarks that can be used to compare countries' mix of economic and social infrastructure,[15] each country's demographic and development planning should dictate the mix best suited for it.

When countries and municipalities are struggling with limited fiscal space, hospitals and schools may not be at the forefront of planning priorities, and these may be required to give way to economic infrastructure. In fact, some advocate for a priority in economic infrastructure over social, arguing that the former may contribute to economic growth at a faster speed than the latter.[16] But surely economic growth is only one lens to view economic infrastructure. And the argument feels out of place at the time of writing, when renewed attention is paid to the role of social - and economic – infrastructure in helping society cope with the coronavirus pandemic. Cities are thinking about investment in improved housing that allows social distancing in densely populated slums, adequate supply of water and sanitation to prevent transmission, reliable transportation for accessing healthcare as well as ensuring food supplies, and of course healthcare facilities, epidemiological capacities, competent medical personnel, and so on. And as cities look forward to reopening and rebuilding, some are also looking for ways to make their economic and social infrastructure assets more inclusive in order to correct past racial disparity and social inequality.

We know surprisingly little about social infrastructure compared with economic infrastructure (Inderst 2020). As an illustration, inclusiveness literature consulted in this review tends to favor economic infrastructure over social infrastructure. Of the 33 projects financed by various multilateral and regional development banks and presented by the Global Infrastructure Facility to demonstrate inclusive and sustainable infrastructure (IDB 2017), one is in the health sector, two are urban renewal / development projects, and one is in solid waste, whereas the rest are either economic infrastructure case studies or about processing projects or on sustainability. The Global Infrastructure Hub (2018) contains eight cases, seven of which are economic infrastructure projects while the eighth is a sporting and events stadium project. It is possible that these projects were selected to illustrate how to embed inclusiveness in hard infrastructure that is not so accustomed to addressing softer issues.

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[15] Inderst (2020) quoting European Investment Bank EIB Investment Report 2018/2019. European Investment Bank.

[16] Inderst (2020) quoting: Atiola, M., Li, B.G., Marto, R., & Melina, G. (2017). *Investing in Public Infrastructure: Roads or Schools?* IMF Working Paper WP/17/105. Atiola, et. al. argue that roads may contribute to economic growth at a faster speed than schools.

The information communication technology (ICT) sector is the frontier sector in economic infrastructure. The sector has evolved to the point that it is now at the crossroads of soft and hard infrastructure, and economic and social (Inderst 2020). Even though this important sector is surprisingly underrepresented in the above case studies (e.g., GI Hub has one case study in the information communications sector, whereas IDB (2017) has none), it has the potential of becoming the latest tangible example of inclusion in infrastructure, such as enabling users to have access to a huge variety of social and economic services. The demand for ICT services, such as a myriad of online services for people around the world forced to shelter in place and work from home, has surged during the coronavirus pandemic. Without a doubt, new investments will pour into this sector, even before the abatement of the pandemic.

Digital inclusiveness faces challenges that are different from the other economic infrastructure sectors. The digital sector (also known as ICT or information and communications technology sector) is well integrated into other sectors, making it difficult to separate out its own environmental and social impacts (its environmental footprint is concentrated in data centers). But it does have distinct challenges, such as privacy and surveillance issues. As states facilitate and welcome such investments, additional capacity and processes are required to ensure affordable, safe and secure digital access for all, while avoiding harm, especially exclusion (or persecution) that can result for certain users of ICT services.

Finally, there is no such thing as inherently inclusive infrastructure – this point was clearly articulated by the participants in the Workshop. Infrastructure that is labelled or promises to be 'inclusive' is no exception. Inclusiveness aspects of infrastructure must be deliberately designed and demonstrated, and blind spots and unintended harm must be carefully avoided or corrected through due diligence.

5. Obstacles to inclusiveness and infrastructure

In November 2019, UNEP and UNOPS organized a day-and-a-half Workshop on Inclusive Infrastructure in order to gain insight into inclusiveness and sustainable infrastructure. Since the UNEP team has already produced a complete record of the Workshop,[17] this paper will not duplicate it. Instead, this paper attempts to capture some of the obstacles to achieving inclusiveness in infrastructure that the participants identified.

In general, the relationship between sustainability and inclusiveness seemed unclear to many participants. These words were used at times interchangeably in the Workshop discussions. At the same time, the participants were clear that inclusiveness is not an isolated phenomenon, but is part of sustainability, and that infrastructure cannot be sustainable without inclusiveness and inclusiveness alone does not guarantee sustainability in the broader sense. (In fact, the GI Hub (2018) observes that there is a need to better distinguish and define the relationship between inclusivity and sustainability, and that addressing these issues as part of the wider inclusivity agenda can help to ensure that vulnerable segments of the population are identified, and appropriate mitigation measures are put in place.)

Participants felt that this confusion may be attributable to the fact that no authoritative definition and standards on inclusiveness exists to inform the sustainable infrastructure discourse. There was an overall agreement that too many competing standards on sustainable infrastructure exist, even though

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[17] Supra n. 4.

none is universally authoritative and consistently referred to in practice. And notwithstanding this multiplicity in standards, we still lack comprehensive principles on inclusion. The Workshop organizers suggested a principles-based approach that integrates existing standards as much as possible for the sustainable infrastructure guidance framework that is under preparation by UNEP.

The theme of inclusiveness is incredibly multidisciplinary. In order to ensure good implementation, all stakeholders must be invited to contribute to the inclusiveness discourse and implementation. The topic of social inclusion is one that preoccupies economists, social scientists, anthropologists, urban planners and architects. Planners are particularly important stakeholders who can help ensure that sustainability is embedded in project design at the upstream stage of the project life cycle; as a result, their professional bodies should take active part in this discussion. Beyond these professions, the direct voices of those who are vulnerable and marginalized must be sought. Multiple UN bodies can also make meaningful contribution to the inclusiveness topic.[18] The Workshop participants also wished to see more private sector representatives take part in the discussion. It was not possible for all these stakeholder groups to come together for a joined-up thinking, and the participants generally expressed their frustration about the existing siloed approach to sustainable infrastructure.

Finally, the participants discussed the fact that data on sustainable infrastructure, including data on inclusiveness, such as disaggregated data on vulnerable groups, is generally lacking. This may in part be due to the lack of transparency in the infrastructure sector, but may also be attributable to the sector's ongoing failure of to monitor and systematically collect relevant data. Key performance indicators (KPIs) for sustainable infrastructure are not routinely used in projects to measure performance and as a basis for public reporting. This data vacuum stifles efforts to properly evaluate the sustainability and inclusiveness performance of various infrastructure projects. It also means a lost opportunity for sustainable infrastructure policy and practices to be informed by up-to-date data that covers all the basis.

6. Possible collective action and research on the nexus of inclusiveness and environmental sustainability

Reflecting on the relevant literature, and taking note of the stakeholder input at the Workshop, this paper suggests the following agenda of possible collective action and additional exploration and research on a number of outstanding areas. The research topics are not necessarily proposed for academic treatment but as collaborative research projects that could involve interested experts and organizations, possibly under the auspices of UNEP, UNOPS or other UN organizations.

a. Comprehensive and authoritative standard and guidance on inclusive infrastructure

Notwithstanding the numerous initiatives that set out standards, guidance and indicators on sustainable infrastructure, the sector is still missing a comprehensive, authoritative and universal source materials on the topic. Governments, the private sector, CSOs, as well as the UN and the MDB systems as a whole

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[18] For instance, the United Nations now has a Disability Inclusion Strategy, which establishes a vision for the UN system as a whole on disability inclusion for the next decade, and aims at establishing an institutional framework for the implementation of the Convention on the Rights of Persons with Disabilities and the 2030 Agenda for Sustainable Development, among others. Available at: https://www.un.org/en/content/disabilitystrategy/assets/documentation/UN_Disability_Inclusion_Strategy_english.pdf (accessed on 1 May 2020).

can benefit from a uniform approach to sustainable infrastructure with adequate content on inclusiveness, to ensure a more uniform and coordinated approach to implementation. For this reason, UNEP's ongoing work on the sustainable infrastructure framework should continue and be embraced by the entire UN system, and all relevant stakeholder groups.

Ideally, this framework should reflect all the technical expertise within the UN, including expertise on inclusion, and various vulnerable groups, while taking into account the G20's QII Principles and the other key principles of the prevailing standards and initiatives on sustainable infrastructure. The framework should include a comprehensive definition of inclusiveness. It should be created in a collaborative manner with all stakeholders inside and outside the UN. The international human rights and environmental framework should be used as a touchstone to ensure comprehensiveness and policy coherence, and the use of human rights due diligence should be encouraged. Depending on the timing, the framework could enrich the discussion of the Infrastructure Working Group of the G20 on the implementation of the QII Principles, and vice-versa.

In addition to these large-scale global standard setting efforts, technical guidance may be desirable in the following areas:

- o Linking spatial planning with strategic impact assessment[19] is one way of moving inclusiveness consideration upstream of decision-making
- o Additional examples of environmental sustainability projects that integrate and enhance inclusiveness could signal how projects could be structured and possibly scaled up
  - The Right Energy Partnership with Indigenous Peoples[20] is one example of an ongoing effort to integrate inclusiveness in renewable energy projects that may be replicable around the world
- o Examples of inclusiveness in social infrastructure through case studies should be useful, since so few are included in the literature consulted for this review
- o Methodologies and case studies on prioritization of inclusive infrastructure, including social infrastructure, in decision-making will be helpful
- o A separate exploration of digital inclusion and the broader sustainability challenges associated with digital access should be considered

b. Enhancing capacity in decision-making to ensure inclusion

Numerous standards, guidance and tools already exist to assist decision makers in their day-to-day work to deliver infrastructure.[21] Yet it is not clear at all whether decisions are actually informed by data, options, and recommendations that the standards, guidance and tools can generate. In fact, it is plausible that most decisions are made as political decisions in the absence of (or in spite of) proper sustainability inputs and data. More research and programs to support the capacity of decision makers are needed. This should not necessarily lead to more methodology and tools; instead, targeted input

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[19] As suggested by Eggenberger & Partidário (2000).
[20] Available at: https://www.indigenouspeoples-sdg.org/index.php/english/who-we-are/right-energy-partnership-members (accessed on 1 May 2020).
[21] For example, see: OECD and World Bank (2018). *G20/OECD/WB Stocktake of Tools and Instruments Related to Infrastructure as an Asset Class – Background report.* Available at: http://www.oecd.org/g20/G20-OECD-WB-Stocktake-of-Tools-and-Instruments-Related-to-Infrastructure-as-asset-class.pdf (accessed on 13 April 2020).

and incentives are needed for public officials to perform their official duties well. Professional networks and peer learning events may enable decision makers to learn from and support each other.[22]

An alternative approach may be to identify certain responsibilities of decision makers and to delegate them to independent experts, or an independent commission, quasi-public research organization, or think tank, as discussed at the Workshop. This may liberate infrastructure decision-making from politics and politicians to a degree. Yet there is no assurance that these bodies function as publicly accountable bodies; furthermore, it could also deprive important capacity that traditionally exists inside the government and exercised through democratically elected officials (if democracy functions in the relevant state). Although limited anecdotal examples exist,[23] more research is needed on how these institutions function and the pros and cons of such methods of consensus building and decision-making.

One practical next step could explore ways in which international, national and grassroots CSOs can engage with government officials and the private sector in a structured manner to help articulate alternative capacity building approaches that aim to produce sustainable infrastructure with inclusiveness. Such engagement could take place at the country level, or be part of a global learning network that includes stakeholder groups as organizers and members.

c.   Mapping inclusion indicators and data sources

In theory, well designed indicators for sustainable infrastructure, including indicators on inclusion aspects, should promote future data collection and enhance the transparency and accessibility of data. However, as a practical matter, compilation of such indicators and data collection will be daunting.

Several organizations already collect social inclusion data using tailored indicators.[24] Although it is not clear if any could be directly relevant for the purpose of inclusive infrastructure, it may be worthwhile to map such ongoing initiatives around the world and ask how the indicators are applied, the identify of data providers and users, data platforms in use, and areas of overlaps and gaps. UNEP's MapX initiative may provide useful insights into the possible steps that UNEP and others could take on inclusion indicators and data.

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[22] See, for example: International Network for Environmental Compliance and Enforcement (INECE), https://www.eli.org/environmental-governance/inece (accessed on 30 April 2020); SBO Network of Senior Infrastructure and PPP Officials, http://www.oecd.org/gov/budgeting/ppp.htm (accessed on 30 April 2020); and The World Association of PPP Units & PPP Professionals (WAPPP), http://blogs.worldbank.org/ppps/ready-launch-world-association-ppp-units-ppp-professionals (accessed on 30 April 2020).

[23] For example, the National Infrastructure Commission of the UK; also see the 30 year infrastructure strategy of Victoria, Australia, by Infrastructure Victoria, available at: https://www.infrastructurevictoria.com.au/project/30-year-strategy/ (accessed on 13 April 2020).

[24] For instance, the World Bank's Country Policy and Institutions Assessment (CPIA) includes four areas including Policies for Inclusion / Social Equity, which contains the following indicators: Gender Equality; Equity of Public Resource Use; Building Human Resources; Social Protection and Labor; Policies and Institutions for Environmental Sustainability. These may be useful in understanding the broad inclusion context of the host country but they are too high level to be meaningful at the project level. See: World Bank (2017). CIPA Criteria. Available at: http://pubdocs.worldbank.org/en/203511467141304327/CPIA-Criteria-2017v2.pdf (accessed on 12 December 2019); Eurostat collects more detailed data, based on 15 primary, 15 secondary and 12 context indicators on social inclusion. See: https://ec.europa.eu/eurostat/web/employment-and-social-inclusion-indicators/social-protection-and-inclusion/social-inclusion (accessed on 12 December 2019). Also see: Labonté, R., Hadi, A., & Kauffmann, X. (2011).

Annex 1

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