SUSTAINABLE INFRASTRUCTURE

How integrated approaches can help deliver the 2030 Agenda?

An inter-agency statement - – a contribution to the G20 DWG [1]

The world is witnessing large amounts of investment in new and existing infrastructure now and in the coming decades.[2] An annual average of USD 6.9 trillion in infrastructure investment up until 2030 is considered indispensable for supporting global development.[3] The bulk of this investment is taking place in developing countries, including fragile low-income economies and emerging economies, driven by population growth, increased income levels, and rapid urbanization in the context of growing inequality and climate change.

Infrastructure is linked to all the Sustainable Development Goals (SDGs).[4] It is in SDG 9 explicitly, but quality, resilient, and sustainable infrastructure is also essential for achieving inclusive growth and sustainable development, eradicating poverty, enhancing resilience to climate hazards, promoting societal well-being, and realizing all human rights. Access to energy and transport, for example, is central to better education, access to clean water and sanitation is a prerequisite for good health, and access to decent affordable housing and infrastructure in both rural and urban areas is needed to build sustainable, safe, resilient cities and communities. Access to basic services such as water and sanitation, healthcare, and education is a human right and critical for gender equality.
Furthermore, **investing in infrastructure provides opportunities for employment creation, income generation and economic growth**. The construction and maintenance of infrastructure creates employment directly while the assets subsequently built up will improve access to services, income, and sustained employment and trade opportunities. The optimal use of local labour and materials will have further backward and forward linkages, stimulating the local economy and contributing to poverty reduction as well as ensuring sustainable construction practices.

Infrastructure systems for transportation, water, energy, housing, industry, food, waste and sanitation, etc. have, however, major impacts on the environment. If poorly conceived, without assessing and addressing their potential impacts early in the planning stage, they may undermine sustainable development. Approximately 70% of greenhouse gas emissions are linked to the construction and operation of infrastructure.[5] The construction of new infrastructure also uses huge amounts of raw material inputs, such as sand and gravel for concrete. The direct, indirect, and cumulative impacts of infrastructure projects also lead to species loss and ecosystem degradation.

New roads and ports, for example, can cause the fragmentation of habitats, and often enable access to previously inaccessible areas, which can result in land degradation and illegal activities such as poaching. Meanwhile, air and water pollutants from infrastructure construction are not confined by state borders. Also, the large-scale infrastructure investments that developing countries will require to meet their needs

[1] This statement builds on the United Nations Environment Management Group (EMG) Nexus Dialogue on Sustainable Infrastructure, which took place in Geneva on 26 February 2019. It will be finalized and reproduced as an outcome document of that dialogue, with full acknowledgement to all contributors.
[2] Infrastructure provides the basic physical systems and structures that support society and the economy. These include systems for water and sanitation, transport, buildings, energy, food, telecommunications, resource use, and waste management. They also include natural infrastructure, i.e. the landscapes and ecosystems that provide services.
[3] OECD (2018). *Investing in Climate, Investing in Growth: A Synthesis.* p. 13. https://www.oecd.org/environment/cc/g20-climate/synthesis-investing-in-climate-investing-in-growth.pdf
[4] Thacker S, Adshead D, Morgan G, Crosskey S, Bajpai A, Ceppi P, Hall JW & O'Regan N. (2018). *Infrastructure: Underpinning Sustainable Development*. UNOPS, Copenhagen, Denmark.
[5] World Bank (2018). *Low-carbon Infrastructure: an essential solution to climate change?* http://blogs.worldbank.org/ppps/low-carbon-infrastructure-essential-solution-climate-change

demand new and innovative approaches to financing and international cooperation. In this context, attention should be paid to risks of unsustainable levels of indebtedness. Modalities of infrastructure financing linked to access to natural resources call for caution.

At the same time, climate change-related risks threaten infrastructure itself. Resilience to climate risks determines the sustainability of infrastructure in the most literal sense; non-resilient infrastructure will not function in the way that it is intended to. Climate change is driving more frequent extreme weather events that can pose major threats to infrastructure and these threats tend to disproportionately impact the most vulnerable members of societies. Adaptation to these risks is, therefore, essential. Infrastructure investment that is not risk-informed can be counterproductive, and disaster-related, poorly planned, designed, and built infrastructure can have major impacts on human health and safety. While infrastructure investments continue to rise, by 2030, the world is expected to lose US$ 415 billion per year – or 7% of investments to be made in infrastructure - in disaster losses in the built environment alone.[1] Such losses are preventable if investments are sensitive to climate and disaster risks, and highlight the need for safe, sustainable, and climate-resilient infrastructure.

Infrastructure development can also have complex social impacts related to displacement, land rights, cultural heritage, indigenous peoples, gender equality, employment, public health, safety and security, sexual exploitation and abuse, and other issues. Rights-based social safeguards, inclusive dialogue and risk management principles should be applied to infrastructure development to ensure that it benefits the poor, leaves no one behind, and respects human rights. Chief among these is the need for inclusive, participatory, transparent, and ongoing stakeholder consultation to be built into infrastructure planning processes. Infrastructure development should be based on free, prior and informed consent, in line with the UN Declaration on the Rights of Indigenous Peoples.[2]

Integrated approaches can increase the sustainability of infrastructure development. Infrastructure investments' impacts are context- and sector-specific and are influenced by initial conditions. In many instances, significant interconnectivities and interdependencies in terms of impacts from infrastructure investments exist. Where this is found to be the case, investments should be planned at strategic level in an integrated way as much as possible, taking into account these interconnectivities. Integrated approaches help to optimize outcomes by considering the interconnections between different infrastructure systems and sectors (including natural infrastructure such as landscapes and ecosystems), aspects of sustainability (social, environmental, and economic), spatial scales (national, regional, local), and governance frameworks (inter-ministerial coordination). A key prerequisite to the efficient and effective delivery of required infrastructure investments is the availability of adequate capacities at individual, systems and organizational level – as well as having a conducive enabling environment. Assessing and, as required, addressing such constraints in those areas needs to be integrated in the approach to infrastructure development.

Designers and planners should apply a mitigation hierarchy that prioritises efforts to avoid negative environmental and social impacts, followed by minimisation, then restoration, with offsetting as a last resort. Because there are often trade-offs among the economic, social and environmental impacts of infrastructure systems that need to be understood by decision makers, a 'life cycle' approach needs to be taken. Stronger mitigation measures should be applied if a project could impact key biodiversity areas, and impacts to all forms of protected areas, including sacred natural sites and territories and areas conserved by indigenous peoples and local communities, should be avoided.

Environmental and social safeguards should be applied as far upstream in the infrastructure development cycle as possible. The main stages of infrastructure development include: needs, capacity, and feasibility assessments; planning; design; financing; procurement; construction; operation and maintenance; and decommissioning. At each of these stages the social, environmental, and economic

[1] Global Assessment Report on Disaster Risk Reduction (UNISDR, 2015)
[2] IUCN (2016). Recommendation 6.012: Protected areas and other areas important for biodiversity in relation to environmentally damaging industrial activities and infrastructure development. https://portals.iucn.org/library/node/46519

implications should be considered and accounted for through comprehensive analysis of the potential synergies and trade-offs across sectors, with safeguards applied at relevant points in the process. Stakeholder consultation should also be built in to all stages of the infrastructure development cycle. Screening for environmental and social risks and application of the mitigation hierarchy is most effective at the earliest stages of planning when avoidance and minimization options are most cost-effective and technically and politically feasible. Early-stage stakeholder consultation and public participation helps to capture as many potential risks and impacts as possible and avoid conflict during later phases of the development cycle.[1]

Nature-based solutions should also be favoured wherever possible. Natural infrastructure can provide substantial environmental, economic, and social benefits, as well as help reduce dependence on built infrastructure, which often has significant environmental impacts and is more expensive to build and maintain. In many cases, natural and built infrastructure approaches can be integrated to deliver optimal outcomes, and can help to achieve no net loss, and possibly net biodiversity gain, at the project level. Dams, for example, can benefit greatly from the presence of forests, which stabilise soils and combat upstream erosion. Such efforts need to be incentivized through conducive policies. The recognition that natural ecosystems such as forests and mangroves play important ecological infrastructural functions needs to be given greater prominence. A proper valuation of natural ecosystems can contribute to their preservation, and thereby the maintenance of infrastructural services they provide to society.

Considering these important trends and opportunities, the below-listed organizations express interest in promoting integrated approaches to infrastructure development as a means of increasing the safety, sustainability, and resilience of infrastructure and accelerating the SDGs and 2030 Agenda. Wherever relevant we will link sustainable infrastructure considerations to our respective or collaborative programmes; support the development, promotion and improvement of integrated infrastructure planning tools, guidelines, norms, and standards, and their application to upstream planning; and facilitate related knowledge sharing, human capacity building, and institutional arrangements. In addition, where relevant, we will seek to link integrated approaches for planning sustainable infrastructure to the growing work on infrastructure financing and look for ways to capture and incorporate the value of nature and social considerations, such as gender, into financing decisions.

We call on all stakeholders to support an integrated approach to the development of sustainable and resilient infrastructure. We call on policy makers to incorporate environmental, social, and economic sustainability into policies and ensure their implementation, while simultaneously creating an enabling policy environment conducive towards inclusive, resilient, sustainable infrastructure investments by removing fossil fuel subsidies and introducing other fiscal incentives. Planners and designers are encouraged to work across sectors to maximize synergies and minimize negative externalities. We call on financiers and contractors to invest in sustainable and resilient infrastructure and adhere to internationally recognized sustainability and quality standards. We call on infrastructure users to adopt sustainable lifestyles that prioritize resource efficiency to avoid damage and waste and reduce the need for new infrastructure.

International Labour Organization (ILO)
United Nations Development Organization (UNDP)
United Nations Economic Commission for Europe (UNECE)
United Nations Environment Programme (UNEP)
United Nations Industrial Development Organization (UNIDO)
United Nations Institute for Training and Research (UNITAR)
United Nations Office for Project Services (UNOPS)

[1] IDB (2017). Lessons from Four Decades of Infrastructure Project Related Conflicts in Latin America and the Caribbean. file:///Users/rowanpalmer/Downloads/Lessons-from-Four-Decades-of-Infrastructure-Project-Related-Conflicts-in-Latin-America-and-the-Caribbean%20(1).pdf