T20 INDONESIA 2022 THINK

Policy Brief

ADVANCING CLIMATE RESILIENCE AND ENVIRONMENTAL OBJECTIVES IN INFRASTRUCTURE PLANNING, DEVELOPMENT AND FINANCE

Task Force 8
Inclusive, Resilient, and Greener Infrastructure Investment and Financing

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Abstract

General sustainability principles are commonly agreed as the basis for infrastructure investments. Private investors are focusing on environmental, social and governance (ESG) compliant projects. And yet, too many infrastructure projects still do not incorporate environmental and biodiversity objectives in line with the Paris Agreement, the Convention on Biological Diversity (CBD) and other environmental commitments. Post-pandemic recovery priorities and new geopolitical tensions have also increased the divergence between short-sighted action and long-term sustainability goals. To shift course effectively in a context of rising political and economic uncertainties and growing environmental losses, the transition towards sustainable infrastructure systems has to change. We propose two larger recommendations to achieve the Quality Infrastructure Investment (QII) principles in this context: 1) establish interoperable sustainability norms for infrastructure planning, investment and maintenance and 2) enhance interinstitutional coordination to break silos and increase data availability. The four proposed sustainability norms are: 1) plan based on land/seascape-scale natural capital and ecosystem services data; 2) improve existing infrastructure efficiencies and invest in maintenance; 3) modernise project cost-benefit analysis to enhance sustainability outcomes and 4) plan and design for "nature-positive" and biodiversity "net-gain." The brief then provides policy recommendations for the Group of 20 (G20) in establishing each norm.

Challenges

The impacts of trends in biodiversity loss, climate change extremes and the effects of the COVID-19 crisis have been made starkly clear by ever more alarming science from the world's leading scientific bodies. The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) definitively states the critical need to rapidly transition to a development paradigm with deep cuts in emissions and far greater investment in resilience and adaptation (IPCC, 2022). And yet, as the world faces another new crisis in Europe with ripple effects in rapidly rising prices for essential basic needs in energy and food and numerous other basic goods, there is renewed pressure to once again defer this essential transition. The most important lessons emerging from this crisis, however, clearly show exactly the opposite need for immediate investment in sustainably planned, designed and built natural and hard infrastructure of the 21st century, not the 20th.

The central role of infrastructure in global sustainability and environment goals (both in terms of positive benefits and negative impacts), including adaptation and mitigation commitments in nationally determined contributions (NDCs), targets of the CBD and improved access to basic services like food, water and energy security in the Sustainable Development Goals (SDGs) has long been acknowledged by global leaders. Leaders of the Group of Seven (G7) endorsed the "G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment" in Japan in 2016, with explicit focus on environmental, climate and social considerations in three of five principles (G7, 2016). The 2019 G20 Summit in Osaka revised these further with stronger sustainability language, endorsing six principles, including "3) integrating environmental considerations in infrastructure; 4) building resilience against natural disasters; 5) integrating social considerations in infrastructure investment" (G20, 2019). The latest G7 leaders' communique from the United Kingdom is even stronger in this regard, clearly articulating the importance of not just strong ESG standards in infrastructure development, but nature-based solutions (NbS) as part of larger resilience strategies (G7, 2021).

International and regional financial and technical institutions have in turn begun to operationalise the QII principles by aligning safeguard systems and investment screening criteria. However, while this is having some impact in screening out unsustainable investments, particularly those most likely to increase carbon emissions, both the impacts on biodiversity and the multiple benefits of nature-based infrastructure solutions (or "natural" infrastructure) continue to be insufficiently considered. This is due to recurrent challenges: insufficient data at the right scale and technical capacity within many countries to provide it and assess risks, and still weak recognition by policy and decisionmakers of the importance of a paradigm shift

towards explicitly planning based on this information. In sum, while some individual projects might be meeting more stringent ESG standards and accounting for NbS benefits, they are still not part of a larger holistic shift in norms that is critical for country commitments and global goals in sustainability.

Current sustainability shortcomings in many public infrastructure investment projects

Recent definitions of sustainable infrastructure have more clearly articulated a comprehensive approach across the full lifecycle of a project to ensure economic and financial, social, environmental (including climate resilience) and institutional sustainability (IDB, 2018; UNEP, 2021). In addition, private sector investors have shown an increasing interest in ESG considerations. Yet application of the environmental factors in decision making remains uneven. Mitigating greenhouse gas emissions is gaining attention but biodiversity and ecosystem services remain the least integrated factors. One cited reason for this lag in addressing nature is that available key performance indicators are not readily translated into a quantifiable financial impact, leaving biodiversity to be considered only during the latter due diligence stages of the process (Oliver Wyman & WWF, 2020).

Infrastructure investors rely on environmental impact assessments and other institutional safeguards to try to limit environmental damage, but these measures are applied too late. Employed on a project-by-project basis, they preclude community consultation at land/seascape scales upstream of detailed designs and financing arrangements, fail to consider systems-scale cumulative dynamics and impacts across sectors, make mitigation measures seem like costly add-ons and do not promote biodiversity gains (UNEP, 2021). Project-level design also rarely sufficiently considers well-researched forecasts of future infrastructure service needs based on socioeconomic trends or climate scenarios.

Decisionmakers at the local, national and global level are still not realising the full potential of nature-based infrastructure solutions. While ecosystem services are increasingly valued, their benefits are rarely incorporated into infrastructure sector plans because current cost-benefit analysis standards and practices do not sufficiently consider the true negative costs of built assets or, perhaps even more significantly, the positive benefits of these solutions (even with significantly increased global awareness in recent years of the potential of nature-based solutions, due in part to an increasing economic case for their multiple benefits). Nature-based infrastructure solutions are fundamentally disadvantaged compared with built infrastructure in both policy and practice, rarely classified as a comparable or substitute solution for service delivery due to the lack of guidance and engineering know-how.

These sustainability weaknesses in current infrastructure development practices are resulting in collective action failures and classic “tragedies of the commons” at the national and global scale, where the cumulative impact of multiple projects at the landscape scale and entire

sectors globally are still driving negative impacts on wildlife, climate, deforestation and land degradation, regardless of project-level sustainability. Simply stated, without significant change in this status quo, the estimated US$90 trillion in anticipated additional infrastructure development investment by 2040 will make meeting the goals of the United Nations Framework Convention on Climate Change (UNFCCC), the CBD and the United Nations Convention to Combat Desertification (UNCCD) impossible (Global Commission on the Economy and Climate, 2016).

Proposals for G20

To address these challenges and help countries meet their commitments to global sustainability goals we propose the following two overarching considerations applied to the infrastructure sector:

- reforms in planning, investment and maintenance to achieve universal sustainability norms applied to all large scale, high-impact infrastructure investments; and
- increased institutional coordination at all levels to increase transparency and data access and improve project planning for sustainability.

These two considerations include the establishment of specific norms, the policy recommendations necessary to achieve them and provide the necessary framework for improvements in planning and delivering more sustainable infrastructure.

Recommendation 1: Establish interoperable sustainability norms for infrastructure planning, investment and maintenance

The realities of increasing climate change impacts and future risks, social changes like mass migration and a worsening biodiversity crisis, alongside increasingly cheaper, more pervasive data and technology and the increasingly demonstrated potential of NbS all create both new opportunities and demands for improved strategic and spatial planning for infrastructure.[1] The global community also recognises this need, demonstrated by updated targets and on-going negotiations for the Global Biodiversity Framework (GBF) under the CBD and the recent UN Environment Assembly (UNEA) resolution on the impacts of infrastructure on biodiversity and the opportunities of nature-based approaches (UNEA, 2022).

While there are an increasing number of tools that support spatial planning processes (Krueger et al., 2021; Head et al., 2020), including closing critical information gaps in biodiversity and ecosystem services through national accounts and sub-national assessments (UNSEEA, 2022), large-scale infrastructure projects with significant impact are still being planned and developed without such processes (Head et al., 2020; Solutions Lab, 2020). This is resulting in fewer multi-

[1] Nature-based solutions are actions to protect, sustainably manage and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. https://www.iucn.org/theme/nature-based-solutions

benefit projects without the necessary trade-off analyses of larger temporal or spatial scale impacts on biodiversity or climate risks, or sufficient stakeholder buy-in to endorse projects, ultimately resulting in significant conflicts or cost-overruns and projects not designed to the new realities of a non-stationary climate (IDB, 2019).

The absence of established norms threatens universal uptake and adoption of improved planning and financing practices. For example, the Organization for Economic Co-operation and Development (OECD) Building Resilience report (2018), supporting the Italian G20 Quality Infrastructure Agenda in 2021, offers a new governance approach for infrastructure. This approach seeks to get the best out of the asset over its lifecycle, across functions and tasks and the entire infrastructure system/network, leveraging new technologies and NbS opportunities. Harmonising these approaches through the establishment of sustainability norms described below – achieved through regulatory reform, market incentives, technical capacity development and support, increased transparency and improved governance – should reduce uncertainty and improve decision making for sustainability, thereby reducing sectoral risks and increasing overall private and public investment for high demand infrastructure services.

1) Plan based on land/seascape-scale natural capital and ecosystem services data

Landscape-scale existing natural capital assets and their provision of ecosystem services, accounting for climate risks, should be evaluated in all infrastructure planning decisions to identify opportunities for restoration towards biodiversity net-gain (described in greater detail below) and ensure avoidance of future development of large scale, high impact development in critical biodiversity habitats. For example, many countries and global institutions are increasingly carrying out geospatial information systems (GIS) based-analyses that harness increasingly high resolution and relatively low-cost spatial data on a global scale to better understand current natural capital assets and the critical ecosystem services they provide – either directly supporting or in lieu of engineered infrastructure services – to guide spatial and strategic planning decisions for economic development (UNSEEA, 2022).[2] There are also

[2] For example, the governments of the Bahamas and Belize worked with the Natural Capital Project (a consortium of environmental NGOs and academic partners) to evaluate coastal ecosystem values to guide coastal development planning, including assessing the benefits of alternatives between nature-based infrastructure like mangroves and coral reefs and hardened sea walls (Natural Capital Project, 2019). These are just two examples of an increasingly long list of similar assessments carried out around the world, now ubiquitous enough to support the adoption of this norm (UNSEEA, 2022). Multiple multilateral development banks, for example, now have natural capital labs, to serve exactly this purpose.

increasingly simple tools that downscale and evaluate climate change impacts and risks, allowing for capturing uncertainty through scenario planning (USGS, 2021).

Policy recommendation: The G20 should require that all countries develop national to subnational land/seascape-scale assessments of their natural capital and ecosystem services as the basis guiding future QII, and that they channel funding and technical capacity necessary to implement these assessments.

2) Improve existing infrastructure efficiencies and invest in maintenance

In 2021, G20 leaders endorsed the G20 Policy Agenda on Infrastructure Maintenance, acknowledging that resilient, properly funded, well maintained and optimally managed systems are essential to preserving infrastructure assets over their lifecycles. They also committed to scaling up and encouraging the implementation of NbS or ecosystem-based approaches as valuable tools that provide economic, social, climate and environmental benefits. Ongoing maintenance of infrastructure assets can and should be considered from the earliest stages of a business case analysis (project conceptualisation) to ensure sustainable funding models are put in place, along with contract structures that incentivise maintenance, such as public-private partnerships (PPPs) or private finance initiatives (Arup and Lloyds, 2017). “Low maintenance design” can be particularly beneficial in harsh environmental conditions, or where funding is scarce. “Designing for maintenance” can also help ensure infrastructure design supports access and maintenance (Arup and Lloyds, 2017).

Countries should improve the footprint or utilisation of existing assets to adopt new technologies, increase resilience to more frequent climate extremes and transition to a renewable energy future and restore ecological connectivity instead of investing in entirely new large scale, high-impact infrastructure projects to meet similar needs. Improving maintenance management and increasing investment for infrastructure maintenance makes it possible to boost the resilience of infrastructure against a variety of threats, has a positive financial return for developed and developing countries and creates additional opportunities for maintaining intact habitats and restoring ecological connectivity (Andrew Gregory, Emma Spence, Paul Beier, Emily Garding, 2021).

Infrastructure efficiencies are incentivised within frameworks of fiscal responsibility and transparency, financial integrity and debt sustainability. Where possible, consideration should therefore be given to maintaining existing infrastructure assets over the provision of new assets. Over-investment in new infrastructure can compound budget constraints, leading to increased and unnecessary spending requirements for maintaining new assets (IDB, 2022). As stated by UNEP (2021), “procurement processes that place value on the full lifecycle benefits of

infrastructure can help to ensure more accurate cost estimates, which in turn contribute to the fiscal sustainability of infrastructure investments." Additionally, monitoring asset performance during the operation phase measures the asset's condition, use and functionality, allowing a more efficient use of assets and reduction of lifecycle costs. Without a clear view of the age profile and quality of the asset base, it is impossible for operators to budget appropriately for maintenance funding.

To meet increasing demand and climate adaptation needs, rather than expanding capacity through new infrastructure, governments can maximise asset use and quality for users through demand management techniques, "smart infrastructure," or, when possible, NbS. As seen in an OECD report (2021), new technologies and data science encompassing earth observation, remote sensing, big data, the Internet of things (IoT), cloud technologies, Building Information Modelling (BIM) and machine learning are transforming how infrastructure is operated and maintained while NbS might offer innovative, cost-effective opportunities for supporting infrastructure sustainability and resilience.

Policy Recommendation: The G20 should endorse, through all future QII guidance, that additional investment in efficiencies and financing of maintenance is both considered prior to investments in new assets and sufficient to addresses new climate-related risks and opportunities to enhance service delivery and create nature-positive outcomes and biodiversity net-gains.[3]

3) Modernise project cost-benefit analysis to enhance sustainability outcomes

There are several analytical, policy and planning-oriented tools that are deployed at various stages of the planning and design process for landscape-scale analysis and single project evaluation. These include, but are not limited to, strategic environmental assessments (SEAs), cost-benefit analysis (CBA), environmental and social impact assessments and feasibility studies. While theoretically comprehensive, in practice these tools insufficiently address the new realities of climate variability, dependencies on natural capital and ecosystem services and needs for biodiversity net-gain.

CBA is one particularly critical tool of both public policy and infrastructure planning. The systematic process of calculating the benefits and costs of policy options and projects is now widely regarded as an essential step in the policy and planning process. Yet there are large

[3] This is consistent with the recommendations in the September 2021 TF7 Policy Brief "Maintain Resilient Infrastructure Systems" (Evans et al., 2021).

variations in the extent to which cost-benefit analysis is being used in environmental policy development and project planning and evaluation. There are also wide differences in the extent to which various environmental impacts are being considered in these analyses, across economic sectors and across analytical contexts. For example, in general, energy sector investments and policy proposals are relatively well covered in cost-benefit analyses. But there is often far narrower coverage of non-climate environmental impacts in those assessments than in assessments of investment projects in, for example, the transportation sector (OECD, 2018). The valuation of ecosystem services has become a crucial element (perhaps the most crucial element) in quantifying the contribution of ecosystems and biodiversity to human well-being, but the quantification and application of these services within a CBA are still relatively nascent (Dasgupta et al., 2021; MCC, 2021).

Policy recommendation: The G20 should endorse, through all future QII guidance, that investors use cross-disciplinary advances in modelling climate impacts and ecosystem-service benefits to more systematically and comprehensively capture ecosystem-service, climate and biodiversity costs and benefits.

4) **Plan and design for "nature-positive" and biodiversity "net-gain"**

Recognising the realities of new climate extremes and biodiversity loss driven by land use change and habitat loss, global actors are embracing a relatively new sustainability concept of biodiversity net-gain, defined as "an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand" (government of the UK, 2021). While previous definitions of sustainable infrastructure have focused on minimising or avoiding impact to the maximum extent possible in line with the latest ESG standards (ie IFC PS6), this new paradigm shifts emphasis from "doing less harm" to more substantial restoration contributions towards increasing the overall environmental footprint compared with prior project development. In their 2021 TF7 Policy Brief, Krueger et al. create a strong definition for net-gain as infrastructure that should be planned and developed to maximise use of degraded lands, avoid development in irreplaceable sites essential for conservation, avoid fragmentation and restore and maximise ecological connectivity; and "seek to strengthen, rather than replace, nature's ability to provide services." (Krueger et al., 2021).

Policy Recommendation: The G20 should endorse through all future QII guidance that all new large scale/high impact infrastructure investments should be planned and designed to meet emerging standards for nature-positivity and biodiversity-net gain.

Recommendation 2: Enhance interinstitutional coordination to break silos and increase data availability.

Insufficient interinstitutional collaboration is a critical barrier preventing countries from successfully planning and developing sustainable infrastructure (IDB, 2018). Establishing the above norms and creating the conditions for countries to meet sustainability commitments under global agreements will require both improved coordination within governments – across currently siloed key agencies and ministries – and between government and the private sector (Nofal, 2021).

Any single infrastructure project is the result of a series of planning decisions based on consultations at different scales, directly connected to the larger surrounding ecology and socioeconomic system. However, the sustainability objectives stated by many international players over the past few years require the development of new resources and the creation of bridges between the transportation, energy and biodiversity communities, which have only just begun to emerge. Faced with the challenge of potentially contradictory public policies, there are substantial risks in addressing critical sustainability needs through a piecemeal or siloed approach.

Private investors increasingly recognise the business case for sustainability and require assets to meet ESG criteria to manage risks, respond to regulatory requirements and initiatives such as the European Union taxonomy for sustainable activities (European Commission, 2020). There are a number of innovative examples in this space, including the informal Club for Linear Infrastructure and Biodiversity (CILB), a group of the largest private/public transportation firms in France increasing investment in biodiversity restoration in their footprints, or the Biodiversity and Infrastructure Synergies and Opportunities for European Transport Networks (BISON) project, which aims to create a joint forum built around research to facilitate collaboration between institutional and operational actors, not only in developing a shared vision but above all in concrete, holistic action, in line with the transformative changes called for by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) to address worsening biodiversity loss (European Commission, 2022; IPBES, 2019).[4] In this respect, the mobilisation of research resources contributes to the establishment of common dialogue tools between actors from very diverse communities. Another example is the SOURCE sustainability preparation platform tool, developed by the Sustainable Infrastructure Foundation

[4] Additional examples include the Infrastructure and Ecology Network of Europe (IENE) and associated networks across Africa and Asia. https://www.iene.info/

(SIF) to create a harmonised digital platform for tracking sustainability objectives in major infrastructure projects. SOURCE is a comprehensive platform for both traditional procurement and PPPs and utilised by all major multilateral development banks.[5]

Policy Recommendation: The G20 should promote, through all future QII guidance, increased funding and uptake of platforms that break down sector silos and contribute to shared and coordinated approaches amongst infrastructure stakeholders.

Conclusion

Due to a combination of multiple crises, the gaps between aspirations for sustainable development and the impact of decades of infrastructure investments that have overlooked environmental priorities could become even larger. The COVID-19 pandemic might soon be a lost opportunity to trigger a system change if trillions of dollars continue to be invested in unsustainable projects that exponentially accelerate negative impacts on ecosystems through deforestation and degradation, compromising ecosystem services and biodiversity critically important to country commitments and global sustainability goals.

This dichotomy is clearly evidenced by global spending in response to the COVID-19 pandemic, with some regional recovery packages in line with the necessary transition, but most spending to prop up unsustainable industries and projects. And we are seeing history repeating itself with a new energy crisis in Europe and around the world resulting from the war in Ukraine once again eliciting the wrong response, with some leaders pushing for short-term stability through increased investments in fossil fuel-based infrastructure at the cost of long-term sustainability. While there continues to be significant progress in the proliferation of infrastructure sustainability tools and standards, there is a more fundamental need for change in practice to actually institute the norms outlined in this brief as common practice across all projects and close these enormous gaps between aspirations and reality. If instituted, the norms and policy recommendations we propose in this brief would help G20 countries and the rest of the world shift towards more effective sustainable investments.

These norms are even more relevant in the context of the current war in Ukraine and potential geopolitical ramifications, including future potential divisions between the G7 and G20. In the near future, there might be large differences among competing infrastructure plans such as the

[5] https://public.sif-source.org/source/

G7 Build Back Better World or the Belt and Road Initiative that can only be solved if all approaches are generally aiming for the same sustainability outcomes.

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