

**Expanding the pipeline of sustainable infrastructure investment opportunities:
Guidance for governments and international organizations**

**A Background paper for FSDO, UNDESA
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Final Draft

Executive Summary

More than ever, economic and social infrastructure is critical for the resilience and prosperity of all countries. Sustainable infrastructure – infrastructure that ensures economic, financial, social, environmental (including climate resilience), and institutional (or governance) sustainability over the entire infrastructure lifecycle – can bring about holistic, multi-layered and long-term benefits to people and the environment. It can help countries pull themselves out of the pandemic, accelerate recovery, and grow resilient against future crises.

The cost of providing infrastructure to support economic growth is projected to be \$94 trillion between 2015 and 2040 whereas the global cost of meeting the SDGs is estimated to be at \$4.0 - \$4.5 trillion a year through 2030. These amounts far exceed the traditional public sector spending on infrastructure. At the same time, an unprecedented combination of unsustainable levels of debt, cash flow problems and capital flight following the pandemic has hit developing countries and especially the poorer countries hard. The world is even farther behind in bridging the infrastructure financing gap.

Even before the pandemic, the flow of cross-border investment in infrastructure has been on a downward trend, but Covid-19 exacerbated it drastically. Experts estimate that the gap between investment in sustainable infrastructure in developed and developing countries is also widening. Public and private investors consistently attribute this depressed state of investment in infrastructure to a lack of a significant project pipeline of well-prepared and well-structured infrastructure projects in emerging markets.

Numerous political, policy and project measures are already in place to help with pipeline creation and project preparation. But they are overshadowed by a mix of complex challenges. To begin with, the so-called infrastructure financing gap is not the only infrastructure gap. There is also a serious gap in the financing for project preparation. Project preparation facilities (PPFs) are one of the key project-level measures already in use, but they operate below their potential due to the narrow scope and lack of flexibility and transparency. Policy-level measures, consisting of strategy and policy, plans and pipelines, laws and regulations, and standardization tools, can be difficult to coordinate and patch together. At the political level, short-termism can detract from the long-term outlook necessary to oversee infrastructure development and operation. These challenges are magnified significantly in least developed countries and small island developing states.

Another infrastructure gap is the sustainability gap. The adverse environmental, social, economic and governance impacts associated with infrastructure frequently originate at the very point of project selection and siting. From this point forth, a project will likely lock its course on a traditional pathway and course correction toward sustainable infrastructure will be nearly impossible. The existing measures to improve project pipelines only partly address this sustainability gap.

As countries pursue infrastructure projects, they should aim to address a combination of the pandemic, climate, inequality, and other crises with the right mix of economic and social infrastructure. To do this, governments must invest in a national infrastructure planning process, align planning with the SDGs, and prioritize sustainable infrastructure over traditional infrastructure. There is no silver bullet for all the challenges; however, incremental changes based on innovative precedents can potentially make a difference on the ground.

The following table summarizes the existing political, policy and project measures, the challenges, and the possible solutions recommended by this report.

Type of measures to support pipelines	Type of challenges	Possible solutions
<p>Political:</p> <ul style="list-style-type: none"> • Strategic vision and stewardship of infrastructure planning process • Allocation of resources • Institution and capacity building 	<ul style="list-style-type: none"> • Conflict between political short-termism and long-term infrastructure agenda • White elephant projects • Insufficient capacity • Insufficient sustainable development consideration 	<ul style="list-style-type: none"> • Decoupling political processes from infrastructure through independent institutions • Improved programs that build deep-rooted and multi-disciplinary capacity in sustainable infrastructure
<p>Policy:</p> <p>Infrastructure framework with:</p> <ul style="list-style-type: none"> • Strategy and policy • Plans and pipelines • Laws and regulations • Procedures and guidelines • Standardized criteria, templates and model contracts 	<ul style="list-style-type: none"> • Insufficient donor support for infrastructure frameworks • No plans & pipelines or no disclosure of them • Insufficient internal coordination • Insufficient sustainable development considerations 	<ul style="list-style-type: none"> • Availability of funding for infrastructure framework • Transparent plans and pipelines • Stronger internal coordination for better integration of sustainable infrastructure decisions • Standardized criteria, templates and contracts aligned with international good practice in sustainable infrastructure
<p>Project:</p> <ul style="list-style-type: none"> • PPFs, PDFs and other technical assistance during project preparation, processing and approval 	<ul style="list-style-type: none"> • Insufficiently funded and fragmented PPFs • Narrow focus on projects, and insufficient support for upstream activities or sustainable development • Insufficient focus on LDCs and SIDS • Lack of data on PPF and PDF operation and effectiveness 	<ul style="list-style-type: none"> • Recasting PPFs as a programmatic facility with focus on upstream phases and SDGs • Better coordination between PPFs and PDFs • PPFs dedicated to the needs of LDCs and SIDS • Transparency of PPFs and PDFs and common metrics

This report also suggests that international and regional organizations and donor countries in their supporting role should get more out of the existing resources directed to the political, policy and project measures to facilitate countries expand their pipeline of sustainable infrastructure projects. They should:

- (i) coordinate and consolidate efforts to better promote sustainable infrastructure
- (ii) review respective PPFs and coordinate with other PPFs and PDFs
- (iii) focus on LDCs and SIDS, especially those countries that need planning assistance the most
- (iv) provide space to collaborate with the private sector in relation to pipeline creation, e.g., the establishment of independent institutions and management of unsolicited proposals, and
- (v) collect and publish data on PPFs and establish measurement indicators for effectiveness.

The UN Department of Economic and Social Affairs can play a valuable role in connecting country representatives, investors, and MDBs. For example, it can convene:

- (i) a learning session on planning for sustainable infrastructure projects and pitching sessions dedicated to the LDCs, especially the top reformer countries, at the SDG Investment Fair
- (ii) discussions on improving collaboration among the PPFs, coordination with PDFs, data collection, and impact measurement; and
- (iii) discussions on the topic of private sector participation in infrastructure planning and making pipeline proposals in collaboration with the Global Investors for Sustainable Development Alliance

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List of Abbreviations

Addis Agenda	Addis Ababa Action Agenda of the Third International Conference on Financing for Development
DESA	UN Department of Economic and Social Affairs
FDI	Foreign direct investment
GISD	Global Investors for Sustainable Development
ICT	Information communication technology
INFF	Integrated National Financing Framework
LDCs	Least developed countries
MDB	Multilateral development bank
MFD	Maximizing Finance for Development
PDF	Project development facility
PPF	Project preparation facility
PPP	Public-private partnership
SDGs	Sustainable Development Goals
SIDS	Small island developing states
UNEP	United Nations Environment Programme
UNOPS	United Nations Office for Project Services

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I. About this Paper

More than ever, economic and social infrastructure is critical for the resilience and prosperity of countries, whether developed, developing or least developed. As they scramble to support health, water and sanitation infrastructure to cope with the ongoing global pandemic, many countries are also turning their attention to infrastructure for the post-pandemic society. They are reimagining a transportation system that moves essential workers, people and goods around in a manner that is efficient, equitable and climate friendly. The information communication technology (ICT) sector that made telework, telemedicine, remote learning, food delivery, entertainment and logistics possible during the pandemic is expecting further growth and innovation. A resilient, nimble and clean energy system provides the underpinning for health facilities and vaccine cold chains, climate-friendly mobility of people and goods, access to data and more.

By providing infrastructure services, countries can fulfill a specific goal among the Sustainable Development Goals (SDGs) – that is Goal 9 on industry, innovation and infrastructure; moreover, provision of infrastructure can contribute to the fulfillment of up to 72% of the targets under the SDGs (Thacker, et al (2019)).¹ Sustainable infrastructure – infrastructure systems that are planned, designed, constructed, operated, and decommissioned in a manner to ensure economic, financial, social, environmental (including climate resilience), and institutional (or governance) sustainability over the entire infrastructure lifecycle² (see Box 1) – can do even more. It can bring about holistic, multi-layered and long-term benefits to people and the environment. It can help countries pull themselves out of the pandemic, accelerate recovery and grow resilient against future crises (Aizawa 2020).

The cost of providing infrastructure to support economic growth is projected to be \$94 trillion between 2015 and 2040 (Global Infrastructure Hub 2019) whereas the global cost of meeting the SDGs is estimated to be at \$4.0 - \$4.5 trillion a year through 2030 (World Bank 2018). These amounts far exceed the traditional public sector spending on infrastructure, which has been as much as 85% of global infrastructure spending. Even when development aid is combined with remittances, foreign direct investment, and philanthropy, the world faces a \$2.5 trillion financing gap every year (World Bank 2018). But an unprecedented combination of

Box 1. International Good Practice Principles for Sustainable Infrastructure

The ten guiding principles published by the United Nations Environment Programme (UNEP) in 2021 anticipate the forthcoming wave of global infrastructure investment and specify how environmental, social and economic sustainability must be integrated right across infrastructure decision making, from policy framework for sustainable infrastructure, strategic planning, to designing and building infrastructure.

The guiding principles and the accompanying case studies explain for policy makers how to integrate sustainability into infrastructure planning and delivery. They are focused on integrated approaches and systems-level interventions that can create an enabling environment for sustainable infrastructure. They were developed via global consultation and inputs from experts and UN Member States and recently released and are accompanied by extensive case studies.

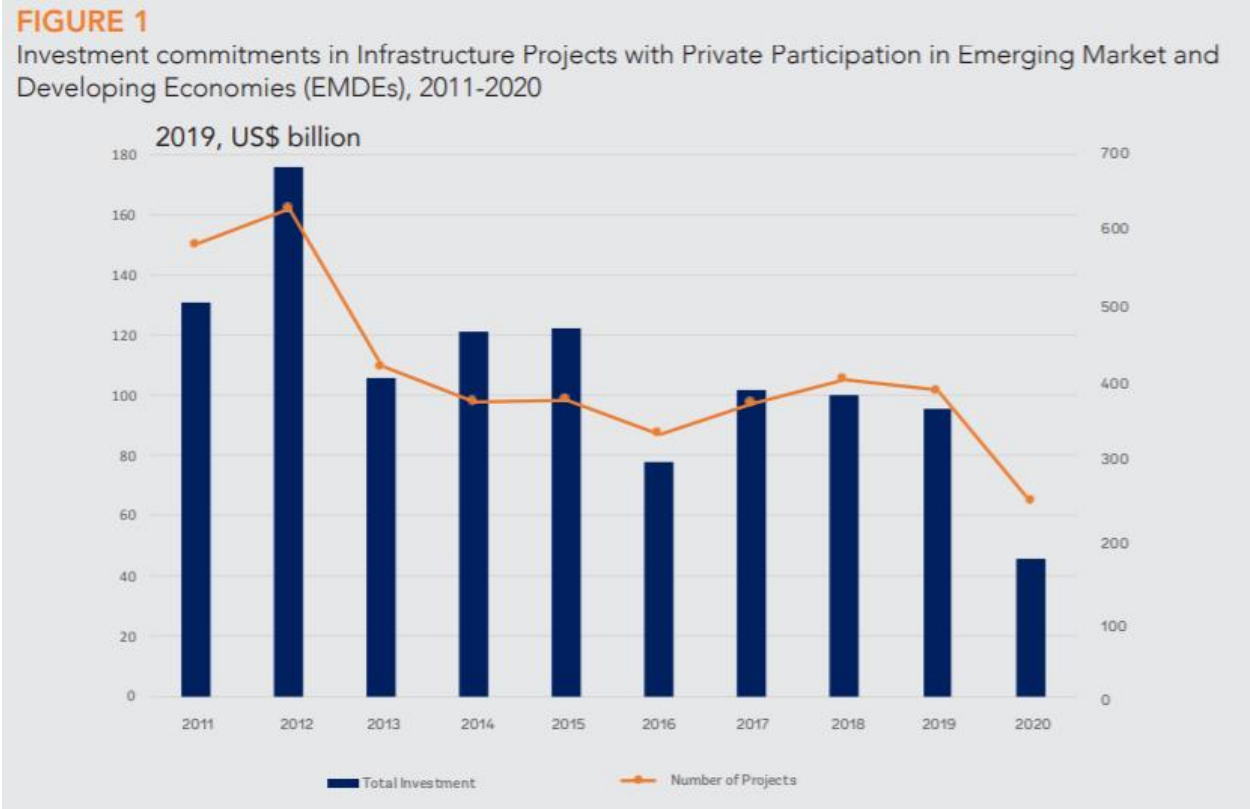
Source: UNEP (2021a).

¹ Thacker, et al (2018) looked at more types of infrastructure and concluded that infrastructure influences as much as 92% of SDG targets.

² This definition of sustainable infrastructure is derived from the definition used by the Inter-American Development Bank (Inter-American Development Bank 2018).

unsustainable levels of debt, cash flow problems and capital flight following the pandemic has hit developing countries and especially the poorer countries hard. The world is even farther behind in bridging the infrastructure financing gap.

Even before the pandemic, the flow of cross-border investment in infrastructure has been on a downward trend, but Covid-19 exacerbated it drastically. Private investment commitment in infrastructure in 2020 was US\$45.7 billion, marking a 52 percent decline from 2019 levels (World Bank 2021) (see Figure 1). Experts estimate that the gap between investment in sustainable infrastructure in developed and developing countries is also widening.³



Source: World Bank (2021). Private Participation in Infrastructure 2020 Annual Report.

Public and private investors consistently attribute this depressed state of investment in infrastructure to the lack of a significant project pipeline of well-prepared and well-structured infrastructure projects in emerging markets. ‘As the number of bankable projects in these countries is low, they do not make up a significant-enough asset class to compel institutional investors to invest the resources necessary for them to analyze possible investment opportunities’ (World Bank 2020).

³ Somewhat counter-intuitively, developing countries did not do as poorly as developed countries in terms of receiving foreign direct investment (FDI) in 2020, but the portion of the FDI flows that aimed to help the realization of SDGs decreased by one-third in developing countries, which is a higher proportion compared to developed countries (UNCTAD 2020).

Countries, bilateral donors and regional and international organizations have already put in place numerous measures to help with pipeline creation and project preparation and processing. But what success they achieved is overshadowed by a mix of complex challenges. To begin with, the so-called infrastructure financing gap is not the only infrastructure gap. There is also a serious gap in the financing of infrastructure project preparation. Based on the \$94 trillion needed in infrastructure globally between 2015 and 2040, project preparation support will cost US \$4.7 trillion over this period, or US \$188 billion annually (Global Infrastructure Hub 2019). Even if donors redouble their efforts to replenish or expand the project preparation facilities (PPFs) they currently support, the project preparation financing gap likely will not be filled in the foreseeable future.

Another infrastructure gap is the sustainability gap (OHCHR and Heinrich Böell Stiftung 2018). The adverse environmental, social, economic and governance impacts associated with infrastructure development, financing and operation frequently originate at the very point of project selection and siting. From this point forth, if a project sets out on its journey on a traditional pathway, it will be nearly impossible to correct its course toward sustainable infrastructure.

These challenges are likely to have magnified significantly during the global pandemic in the least developed countries (LDCs) (UNCTAD 2020) and small island developing states (SIDS).⁴

At the same time, there are a few bright spots in the otherwise dim landscape. For example, the decline in overall FDI flows has so far been more severe in developed economies compared to trends in developing economies (UNCTAD 2020). Private investment in infrastructure improved in the second half of 2020, after countries emerged from lockdowns and the new covid-19 vaccines fueled optimism (World Bank 2021). Some infrastructure sectors have shown surprising resilience against covid-19, even in developing economies. After the most severe lockdown restrictions were eased around mid-May of 2020, investments in renewable sectors returned to near normal levels in many countries, including some developing countries (International Energy Association 2020; UNCTAD 2020). The digital infrastructure sector showed consistent resilience in the face of the changes in traffic, though certain segments of the market did better than others and mostly in developed countries (International Telecommunications Union 2020).

Some data and anecdotes suggest that public sector pension funds and other institutional investors have been slowly but steadily increasing their exposure in certain infrastructure sectors. This modestly encouraging trend, made remarkable by its resilience against the extraordinary disruption brought on by the global pandemic, may be driven by some investors' belief in the ability of investment to make positive contributions to the SDGs while enabling risk management through diversity of portfolio.⁵ The Global

⁴ There are 46 LDCs. SIDS are comprised of 38 UN member states and 20 non-UN members or Associated members of UN Regional Commissions.

⁵ This is different from ESG investing, which is a way to screen for environmental, social and governance risks material to the investor in the due diligence process. SDG investing or sustainable development investing (SD investing), a subset of impact investing, refers to deploying capital in ways that make a positive contribution to sustainable development, using the SDGs as a basis for measurement (GISD Alliance 2021). While the components of ESG and the SDG goals overlap substantially at the conceptual level, in practice, the former tends to resort to a

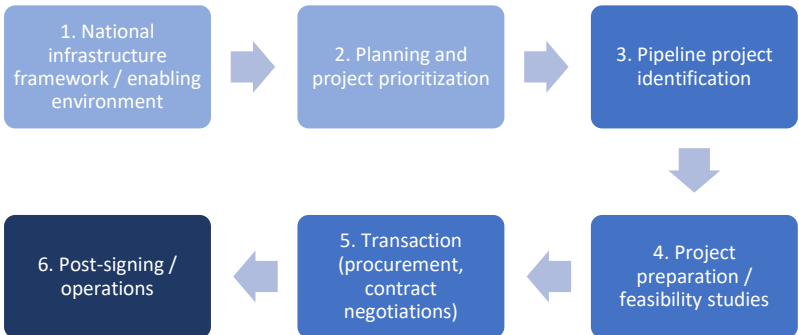
Investors for Sustainable Development or GISD, an alliance of 30 global sector leaders from financial and non-financial corporations convened by the UN Secretary-General, is one such group that is helping to accelerate and scale SD investing, especially in developing countries. Furthermore, the President of ECOSOC has identified financing of the SDGs and sustainable infrastructure development as priorities that require specific action. To support these efforts, the Financing for Sustainable Development Office of the United Nations Department of Economic and Social Affairs (DESA) commissioned this background paper on expanding the pipeline of sustainable investment opportunities, especially sustainable infrastructure projects, to guide governments and investors. Complementary research is underway on the issue of financing and financial instruments to facilitate investment in sustainable infrastructure; as such, this paper is strictly focused on the challenge of pipeline creation.

As countries struggle to recover from the global pandemic, with mounting debt and setbacks from climate change, and with only a trickle of investment flowing in, they need to pursue infrastructure projects with utmost care. As a matter of priority, countries should aim to address a combination of the crises with the right mix of economic and social infrastructure that can achieve as many targets under the SDGs as possible. To do this, governments must align their national planning with SDGs and prioritize sustainable infrastructure over traditional infrastructure. Public actors of all levels and the private sector actors should come together to collaborate and innovate, focusing on quality just as much as quantity. To be sure, this is a huge undertaking that involves a complex sector. There is no silver bullet for all the challenges; however, incremental changes based on tried examples of innovation can potentially make a difference and create a pathway toward recovery and resilience.

II. Measures to fill infrastructure project pipeline

A project’s journey from concept to reality begins even before the point of project identification and selection and extends to many phases ahead. Figure 2 illustrates the six phases of a project’s journey.

Figure 2: Project Phases



limited number of business-oriented indicators for risk management, whereas the latter is intended to align with the SDGs and create positive benefits for people and the planet.

Source: Author's rendition of the Phases of Infrastructure Development, PPIAF PPP Knowledge Lab

This report focuses mostly on the first four phases shown above. Technically speaking, the first two phases are not project-level activities, and many resource materials on project phases omit them and start with phase 3. But a national infrastructure framework, including an enabling environment (phase 1; also see Figure 4) can have a significant bearing on the success or failure of a project and whether it can attract private investment. And the process of national infrastructure planning (phase 2) is at the heart of pipeline creation, without which a discussion on preparation of pipeline projects will lack context. As a result, this report takes an expansive view of infrastructure project phases.

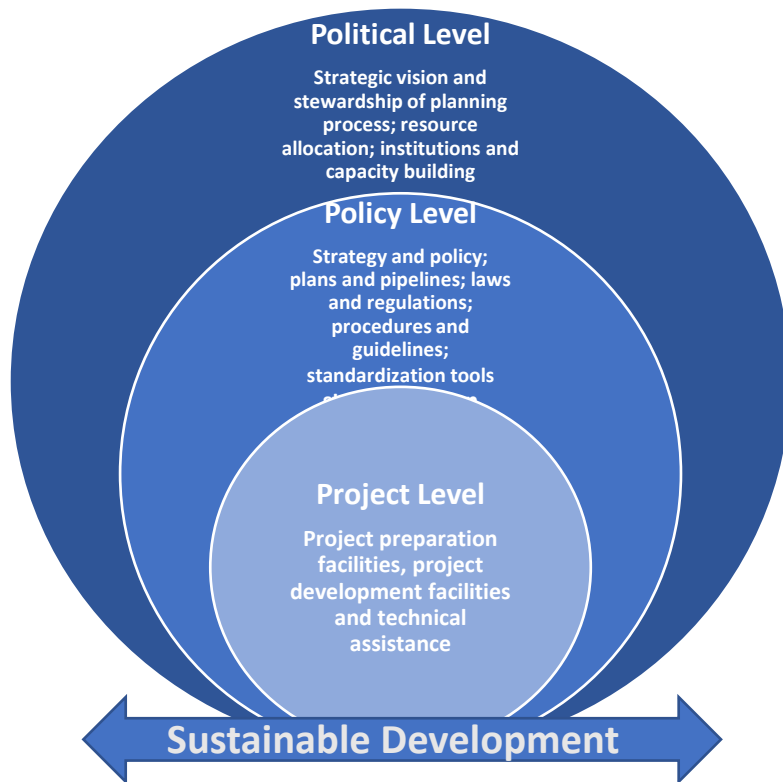
While public actors – from local, national, regional to international levels – and the private sector have distinct roles in these infrastructure development phases, project planning and preparation is primarily the domain of national governments. They are uniquely placed to exercise political authority and mobilize public resources to plan for infrastructure, create project pipelines and accelerate project processing.

Various measures at the political, policy and project levels are already in place to help countries achieve the desired variety of infrastructure projects (see Figure 3). Although these three levels are distinct, in practice, they work in an interlinked and overlapping manner, with national governments as key actors at all levels. Sustainable development considerations and SDG focus crosscut all three levels. (It should be noted that this report presents the three-level of measures as a frame of diagnosis and not as a proposed normative framework. The report does not suggest that taking all measures described will lead to expanded pipelines.)

International and regional organizations, such as the United Nations, multilateral development banks (MDBs), regional authorities (such as regional economic commissions), and bilateral financial or development institutions play significant supporting roles to aid the national efforts. In this landscape, the private sector has a minimal role at the outset, though exceptions are possible.

This section briefly describes the multi-level measures already available to countries to plan, create and support pipelines of infrastructure projects. This analysis is followed by a consideration of some of the key challenges that affect the measures. The report concludes with recommendations to address the key challenges.

Figure 3: Political-, policy- and project-level measures



a. Political-level measures

The complex process of infrastructure development calls for strong political will and leadership at the national level (or subnational level, as relevant). The project-level and policy-level measures discussed below depend on them. From envisioning the national (or local) infrastructure agenda, overseeing the planning process, proposing projects, pushing projects through the pipeline, to keeping the political constituencies and stakeholders engaged in and satisfied with the infrastructure agenda, the political leaders are ultimately in charge of all phases of infrastructure development and accountable for their actions.

The national infrastructure planning process is a crucial step in project identification and pipeline creation. Project identification can either be an ad hoc, one-off process or a part of a strategic national infrastructure planning process. A one-off project may materialize from a political process or an unsolicited proposal by a business enterprise. It may or may not have any bearing on the sustainable development of a country, and at worst, may turn out to be a white elephant that will never see the light of the day. In any event, it is impractical to attempt to fill a project pipeline with one-off projects. Alternatively, countries can plan its infrastructure projects strategically, based on its needs and means, and aligned with the SDGs (see Box 2).

To ensure that the planning is compatible with the country’s needs, including the need to fulfill the SDGs, the planning can be done in reference to the country’s Voluntary National Review, which is a country-led regular review of progress made on the SDGs at the national and sub-national levels. It should be carried out in a consultative manner, through a process that involves all relevant stakeholder groups. When done well, a country should have a project pipeline with the right mix of projects of appropriate scope and size, sequenced correctly, and supported by the people. This approach ensures no white elephant appears in the pipeline.

Heads of state and appointed officials are also responsible for mobilizing adequate domestic financial resource or ensuring other sources of finance throughout the process. Having own skin in the game, in the form of financial contributions to a national infrastructure agenda, and especially through project development facilities (PDFs), can help governments remain committed to the agenda beyond the short term. Such commitment and ownership can directly translate into an efficient allocation of domestic financial resources, with an inherent incentive to curb waste and corruption, stem illicit flow of funds, and avoid white

elephants. A parallel process under the Integrated National Financing Framework (INFF)⁶ can help them envisage how to finance the achievement of SDGs through infrastructure.

Equally essential are government actions that establish specialized institutions for infrastructure, staff them with capable management and staff, and acquire and retain capacity, including capacity to integrate SDGs into operations. In addition to line ministries that propose and/or regulate specific infrastructure assets (e.g., energy, transportation, telecommunications) and the ministry of finance that oversees the allocation of financial resources and administers the PPPs, countries often establish investment promotion, PPP units and other infrastructure agencies to promote and facilitate the process of private investment in infrastructure. To signal high-level political support, these units often have a direct reporting line to the cabinet or the office of the head of state. For example, Jamaica's PPP agency, which sits in the Development Bank of Jamaica, reports directly to the Cabinet's Privatization Committee, which includes the Prime Minister as a Committee member. In many cases these institutions are staffed with personnel with private sector experience or expertise. PPP units with several successful PPP projects under the belt are highly prized as they can give investors a sense of confidence. Increasingly, countries are experimenting, in collaboration with donors, and with the private sector in some cases, with building new types of institutions better suited to planning and delivering the long-term national infrastructure agenda.

These political level measures taken together can signal a country's ownership of the national infrastructure agenda, as well as a strong sense of the nature of infrastructure as a public good regardless of who owns or operates it. These signals are indispensable when bringing in the private sector to participate in infrastructure financing or operations.

b. Policy-level measures

Countries resort to various policy, legal and technical measures to define the national infrastructure framework and the conditions of investment in infrastructure. These policy-level measures typically consist of infrastructure strategy and policy, plans and pipeline of projects, as well as investment, PPP and/or sectoral

Box 2. Strategic Infrastructure Planning in St. Lucia

Long-term strategic planning in St. Lucia began with a National Infrastructure Assessment 2019-2020, designed to ensure that social, economic and environmental needs are all met in a range of future scenarios. Comprehensive data were collected on a set of defined infrastructure assets. Based on this information, infrastructure planning focused on four interdependent infrastructure sectors: energy, water supply, wastewater and solid waste. It analyzed future changes in demand for these sectors determined by trends in the resident population and tourist arrivals. The government determined the key drivers influencing the provision or demand for infrastructure. Modelled outcomes then provided the basis for decisions and recommendations concerning the type, capacity, location and sequencing of proposed infrastructure interventions.

Source: UNEP 2021b

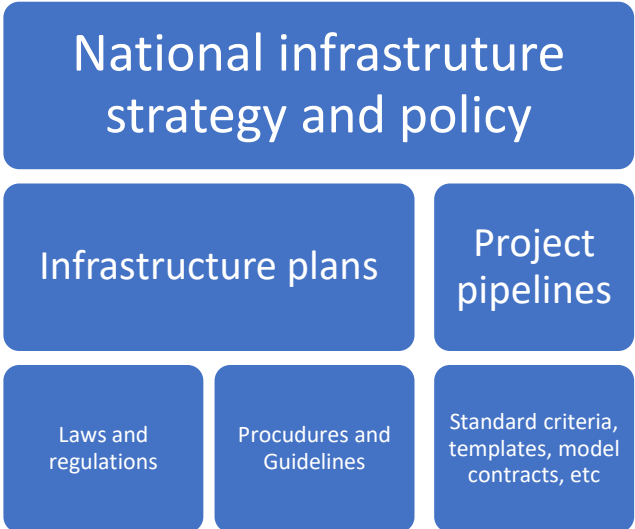
⁶ INFF is a tool to finance national priorities and operationalize the Addis Agenda at the national level. See: <https://www.un.org/development/desa/financing/what-we-do/other/integrated-national-financing-frameworks/about-inff#:~:text=Integrated%20national%20financing%20frameworks%20are,what%20needs%20to%20be%20financed.>

laws, other areas of the law (such as anti-corruption law, environmental law, labor law, to name a few), regulations, guidelines, formal procedures, and tools for standardization, such as criteria, templates and model contracts (see Figure 4).

An integral component of the framework is an enabling business environment that fosters private investment in infrastructure. Sectoral policy and law, PPP law, investment law and similar instruments declare that private participation in infrastructure is possible and welcome, even in sectors that were historically operated by the state. In recent years, existence of a PPP law became an indicator of national readiness for private investment in infrastructure. At the time of writing, at least 139 jurisdictions are known to have PPP laws, according to the World Bank’s Public-Private Partnership Legal Resource Center website.

Other important policy measures include infrastructure or sector plans and pipelines of projects, which materialize from a process of needs assessment and strategic and integrated planning process. As an example, Colombia has a master plan in the transportation sector, with a 200 plus project pipeline, of which 90 have already been implemented. The country attributes the high level of private investment it enjoys to this master planning process. The plan is complemented by other standardized information, including risk allocation criteria and model contracts. Such a complete framework gives countries and investors a clear long-term outlook on policy goals and future projects, and conveys a sense of discipline, stability, and predictability.

Figure 4: National Infrastructure Framework



A well-designed national infrastructure plan and pipeline with an explicit SDG focus enable the government to proactively engage with the institutional, impact, and SDG investors about the government’s ambitions for achieving the relevant SDG goals. It can help governments explain their sustainable development needs and how the pipeline can fill those needs. In other words, an SDG-aligned infrastructure planning helps the government manage the investability of the pipeline, especially vis-a-vis the SDG investors.

Further downstream of the project preparation process involves financial structuring, transaction support, documentation, and reaching financial closure. Clear and consistent laws, regulations, procedures, and guidelines are a must. In addition, document templates, technical criteria, model agreements and other standardization tools that derive from the national infrastructure framework and are consistent with international good practice on sustainable infrastructure will be helpful in this phase (see Box 3). The more comprehensive and consistent the national framework and standardization of processes and documents are, fewer issues are likely left open for lengthy negotiation between project parties, lowering the risk of project delays. Standardization also helps to ensure that the investment terms are consistent across similar projects, thus predictable and fair to all investors.

Transparency is a key success factor in policy-level measures. Transparency of the national infrastructure framework provides people and private investors alike with a clear blueprint of the future. Publicly available infrastructure plans and pipeline projects enhance the perception of openness and readiness of a country to receive private financing. Transparency also helps countries push standardization measures by helping government officials reflect lessons of experience into templates and models.⁷

c. Project-level measures

Project-level measures are designed to work in the pre-feasibility, feasibility and due diligence phases of project preparation in order to ready projects for approval and procurement. In the event that private financing option is preferred, adequate project preparation will help meet investors' bankability requirement. This phase requires projects to generate a quantity of documents, including pre-feasibility and feasibility studies, options and cost benefit analysis for financial and economic viability and value for money, environmental and social impact assessment, and any other studies and processes of validation required under national law or regulation.

As a result, project preparation requires technical expertise, which comes with a big price tag. Project preparation cost is reported to be in the range of 3-12% of the investment. The lower end of this cost range (3-5%) can be expected in developed economies compared with 10-12% in emerging economies. Based on the \$94 trillion needed in infrastructure globally between 2015 and 2030, project preparation support will cost US \$4.7 trillion over this period, or US \$188 billion annually (Global Infrastructure Hub 2019).

To meet these needs, governments resort to several measures. From their own resources, they establish PDFs (sometimes administered by the ministry of finance but they may also sit in the PPP Unit) to help supplement the capacity of government contracting authorities. PDFs are a predominant form of project preparation measure in host countries. In South Africa, the Budget Facility for Infrastructure (BFI) was established to address weaknesses in project preparation and with the delivery of large infrastructure projects. The BFI serves as a financing facility that is fully integrated into the national budget system. It provides specific

Box 3. SOURCE offers many standardization templates

SOURCE is a multilateral platform for sustainable infrastructure led and funded by MDBs. It offers digitized project management support for governments, knowledge management products, numerous standardized project templates by sector for the whole project cycle, aligned with the SDGs and the Paris Agreement, and more.

Source: <https://public.sif-source.org/source/>

Box 4. IDB-IFC Brazilian Private Sector Participation (PSP) Facility

This is a joint PPF developed by IDB and IFC in partnership with the Brazilian Development Bank (BNDES). The facility aims to enhance private sector participation in infrastructure projects in Brazil. In addition to playing a key role in structuring major transportation projects such as toll roads and airports, the facility is also enabling innovative PPPs schools and health care facilities. The facility has served as a laboratory for innovative PPP projects in Brazil.

Source: IDB/IFC websites

⁷ See World Bank (2016b) for guidance on how to establish national disclosure platforms for PPPs.

information on the funds utilized towards project preparation and financing and ensures that fiscal resources are committed in a transparent manner (Barker 2019).

Governments also take advantage of PPFs established by MDBs, donors and other financial or specialized institutions, which help pay for project preparation, and in some cases offer transactional advisory and other services as well. Many traditional PPFs were established by MDBs to ready relatively mature projects for MDB financing, enabling the fulfillment of the lending conditions of the MDB (including procurement, environmental and social safeguards) just as much as meeting the borrowing country needs. More recent PPFs may have complex structure, large revolving fund, and may even include multiple types of support beyond project preparation, such as operational support.⁸ Some PPFs are joint endeavors (see Box 4), or thematic, such as facilities dedicated to climate change or clean energy, while others are elaborate digital platforms that provide multiple services beyond project preparation (see Box 11). This report estimates that existing PPFs probably number in the low hundreds (one study counted 150 facilities for clean energy projects alone (Nassiry, et. al. 2018)).

It is not clear exactly how much is being spent on PPFs. Figure 5 shows some of the major PPFs dedicated to the infrastructure sector, set up by the larger MDBs.

Figure 5: Sample PPFs dedicated to infrastructure projects

Administrator	PPF	Authorized Amount	Year Authorized	Notes
African Development Bank	NEPAD-PIDA Infrastructure Project Preparation Facility	USD11 million	2009	This is a facility dedicated to PIDA.
Asian Development Bank	Asia Pacific Project Preparation Fund (AP3F)	USD73 million	2014	Climate resilience, sustainability and impact on poverty reduction are priorities
European Bank for Reconstruction and Development	Infrastructure Project Preparation Facility (IPPF)	€40 million	2015	Has a Sustainable Infrastructure Window
Inter-American Development Bank	InfraFund	USD20 million		Several other related facilities exist
International Finance Corporation	InfraVentures	USD150 million	2015	Not a grant facility - IFC takes the right to invest
World Bank	Global Infrastructure Facility	USD150 million	2015	Partnership of multiple MDBs and donors. Facility covers four stages of the project life cycle

Source: Various PPF websites. This table only shows the main infrastructure project preparation facilities of the larger MDBs and is not a comprehensive listing of all PPFs of all MDBs. Numerous other facilities complement the ones listed here. Amounts shown are initially authorized amounts and not the remaining balance.

d. Role of regional/international organizations

⁸ For example, the World Bank's project preparation facility is a funding vehicle that supports the preparation of projects under investment project financing, and programs to be supported by Program-for-Results financing and development policy financing. See: World Bank (2016a). This document proposed increased funding and more flexibility in the facility's operation.

International organizations, such as the UN and the MDBs and regional organizations, including regional economic commissions, provide much needed financial and technical leadership and support to countries' infrastructure project pipelines. Most notably the PPFs, many of which are set up by the MDBs to help countries prepare projects for later MDB financing, help bankroll the cost of project preparation.

These types of organizations also play an important role in creating international or regional consensus on the infrastructure agenda for developing countries and the role of private investment. For example, the United Nations Environment Assembly has recognized the importance incorporating sustainability into infrastructure development as a means of achieving the SDGs, while the MDBs are involved in providing financial and administrative support for the numerous regional infrastructure plans. In addition, several multilateral organizations, driven by market conditions and political necessity to support the SDGs, are turning out an array of initiatives to mobilize the 'sleeping trillions' of institutional investors and private equity to invest in infrastructure. Of these initiatives, the Maximizing Finance for Development (MFD) initiative (formally known as the 'billions to trillions' initiative) of the World Bank and other MDBs has been quite visible, though it is not clear exactly how the MFD supports sustainable infrastructure or the SDGs.⁹

In contrast, the Principles for Quality Infrastructure Investment or QII, a product of the Japanese Presidency of the G20, emphasizes the quality of projects rather than quantity. It stresses the need for infrastructure investment to maximize positive impacts, while requiring attention to the environmental, resilience, social, human rights, and the governance dimensions of infrastructure investment, and as such, they have close resemblance to the concept of sustainable infrastructure (Aizawa 2019). It has garnered the support of the G20 countries, including China, and the OECD, and an operationalization is underway, for example, by way of the 'Blue Dot' network of the US, Australia and Japan, as well a new QII Partnership with the World Bank. On the occasion of the G20 Riyadh Summit in November 2020, the Leaders' Declaration again affirmed in no uncertain terms the G20's intention to advance the work related to the QII Principles, and the recent G7 Carbis Bay Summit hinted that a new global infrastructure investment plan, to be known as the Build Back Better World or B3W plan, will be built on the foundation of QII.

Many of these organizations support sustainable infrastructure in multiple ways, from setting principles and standards to creating tools and providing technical assistance and capacity building support, though the outputs overlap and are not always consistent. They also finance all types of capacity building programs for client countries, including those designed to help countries prepare investable projects.

e. Sustainable infrastructure considerations at all levels

Increasingly, sustainable development considerations are being integrated into all levels of measures described above. International and regional organizations are especially instrumental in championing the unique role of sustainable infrastructure in meeting multiple infrastructure and development needs of countries. For example, the World Bank is assisting Jamaica in its efforts to include climate considerations in

⁹ The MFD initiative seeks to turn the traditional model of infrastructure financing on its head by placing private participation in infrastructure at the top of the cascade while pushing down public finance to the bottom as a last resort. The MFD pilot projects involve multiple components, including support from IFC, the private sector arm of the World Bank Group, to structure projects that are attractive to the private sector.

its PPP framework. Some PPFs focus specifically on projects that help mitigate or adapt to climate change (Nassiry and Nakhooda 2016; Nassiry et. al. 2018). Academic institutions, think tanks and civil society organizations often play an important lead or collaborating role in these efforts. While the QII is probably the most politically authoritative initiative to emphasize the sustainability dimensions of infrastructure investment, there are numerous other principles, standards, guidelines, and assessment and rating mechanisms that assist with the implementation of sustainable infrastructure.

The Sustainable Infrastructure Tool Navigator,¹⁰ a joint initiative of GIZ and UNEP that compiles tools to promote sustainable infrastructure, currently lists more than 100 such resources, categorized into policy-level and project-level instruments. Examples include sustainability principles, standards, guidelines and benchmarks; rating systems; financial tools; project preparation tools; modeling tools; and impact assessment tools. The tools are searchable by category as well as by project phases. This Navigator does not evaluate who uses them, how they are used or how they impact projects.

III. Challenges

With an array of measures at multiple levels to expand and support infrastructure project pipelines, government officials pursuing project pipelines have a range of options that aid their day-to-day work. Unfortunately, the measures are not free of challenges, and even when all measures at all levels are in use, they still may not produce the desired outcomes of infrastructure projects, let alone the sustainable types. The following sections examine some of the key challenges.

At the top of the long list of challenges is the fact that no standard metrics exist to evaluate the efficacy of all the measures and that only fragmented data is publicly available to carry out such an evaluation. Considering this state of play, it is not possible to categorically assert which measures should be prioritized and replicated to help with project pipelines. As for the efficacy of the existing measures that promote a pipeline of *sustainable* infrastructure projects – these are quite separate from measures to promote traditional infrastructure projects, as discussed below – we know even less about their effectiveness.

Box 5. The case of Rwanda

Rwanda is a landlocked country in east-central Africa with a population of just over 13 million. It is an LDC with a good track record of economic growth (until covid-19, which caused Rwanda to record the lowest rate of growth, 2%, since the 1994 Genocide). The Government of Rwanda (GoR) has reformed Rwanda's investment climate in order to increase foreign direct investment. It has high rankings in the World Bank's Ease of Doing Business Index, and a reputation for low corruption. The 2020 Infracompass survey of the Global Infrastructure Hub singled out Rwanda as the top performer in Africa and among low-income countries, excelling in the areas of regulatory framework, permits (ranking third out of 76 countries), procurement and financial markets. It praised Rwanda for the most efficient planning and licensing procedures for land acquisition and its insolvency framework. Notwithstanding these achievements (note that other data sites give Rwanda less glowing reviews: see for example 2020 Investment Climate Statements: Rwanda by the US Department of State), Rwanda received an average of \$7.57 million over five years in private investment. At 0.07% of GDP, Rwandan private sector activity in the domestic infrastructure market is the second lowest in Africa. This may reflect the GoR decisions to publicly fund infrastructure. The last significant infrastructure investment was in a water PPP in 2015. Rwanda states it requires investment in ICT infrastructure.

Source: 2020 Infracompass; US Statement Department; IFC; DESA

¹⁰ Available at: <https://sustainable-infrastructure-tools.org/>

When it comes to the LDCs and SIDS, the challenges are likely to be magnified to the point that the measures that can produce a degree of success elsewhere may be of limited effect (see Box 5). Again, data on how the existing measures affect LDCs and SIDS, in comparison to more developed nations, are not readily available.

a. Political-level challenges

When analyzing challenges to infrastructure development, the role of political will and leadership cannot be overlooked. When politicians exert their will and leadership to support a national infrastructure agenda, the agenda likely will undergo smooth implementation. But examples of misdirected political will and leadership are everywhere. Using infrastructure to advance the home country's geopolitical or geostrategic interests, with little regard to the host country's sustainable development, is a familiar example. Heads of state and politicians are perennially fond of excessively grand mega-projects, but these deter investors and often go nowhere, becoming "white elephants"; if such projects move forward at all, they are more than likely to encounter delays and overruns, while underdelivering expected benefits (Flyvbjerg 2011). Overestimating revenues from a user-pay infrastructure project to up its attractiveness is another frequently used political tactic. Equally problematic is a failure of political will to bring up infrastructure in a national political agenda in the first place.

The short political cycle in contrast to the long-term nature of infrastructure development and operation is partly to blame for the challenges. Changes in government and key personnel can lead to modifications or even outright shelving of carefully constructed pipelines and projects as well as loss of valuable capacity in project planning and management. Traditional institutions that regulate infrastructure or promote private investment are helpless in the face of these short-term upheavals.

Other mundane but persistent problems include a lack of coordination among all the relevant ministries, including the ministry of finance, justice, other line ministries, ministries of environment, labor, and so on, in relation to pipeline planning, as well as approval and oversight of projects. This coordination is a prerequisite to a coherent national infrastructure framework and the cascading policy, legal and regulatory instruments.

These political-level challenges impact infrastructure projects from start to finish, but for the purpose of this report, they can be especially detrimental at the point of strategic and integrated planning of an infrastructure project pipeline. Assessing and planning for the right mix of projects for the pipeline with the right scope and scale and in the right sequence is arguably the single-most important measure to create an infrastructure pipeline that benefits the public. For this reason, those countries that do not have any infrastructure plan in place or do not disclose them can severely disadvantage themselves when it comes to sounding the market for potentially interested investors.¹¹

¹¹ Global Infrastructure Hub's InfraCompass 2020 reviewed 81 countries' practices using eight criteria, including planning, to assist countries with policy reforms that lead to better infrastructure investment. With respect to planning, it looked at whether a country publishes its infrastructure plan and pipeline of projects, among other factors. 18 out of 76 countries (23%) publish neither an infrastructure plan nor a pipeline of projects (Angola, Azerbaijan, Bangladesh, Belgium, Burkina Faso, Chad, Denmark, Egypt, Guatemala, Malaysia, Morocco, Myanmar, Niger, Papua New Guinea, Tanzania, Turkey, United States, Vanuatu). Of these, Angola, Bangladesh, Burkina Faso,

Deep-rooted and multidisciplinary capacity across key government agencies involved in infrastructure decision-making and management can potentially insulate infrastructure plans and projects from political short-termism. In developing countries, many of the needed skillsets will have to be acquired as they are likely to be missing from the government's infrastructure toolbox. Adding an SDG lens in the planning process could be a novel exercise for some, though country experience from the Voluntary National Review can be valuable for this purpose. Once acquired, capacity will have to be maintained and updated.

It seems intuitive that PPFs should offer to help build the requisite skillsets as a precondition to project preparation support, yet capacity building sits outside many PPFs' mandates. These facilities are often driven by their own priorities and not necessarily by user needs. Other free-standing capacity building programs may be available but they too have limitations. For one thing, they are likely to be co-terminus with funding, which may be out of sync with the ongoing user needs. Temporary seconding of technical staff does not necessarily result in the expertise being absorbed by the host entity. Volunteer programs are laudable and useful, yet they often lead to volunteer fatigue and cannot be sustained over a prolonged period.

b. Policy-level challenges

The national infrastructure agenda envisioned and articulated by the country's political leadership needs to be captured and concretized in a formal framework for infrastructure for the country. This could be sector-specific. Since these frameworks are the most effective way to generate project pipelines, it is worthwhile asking what roadblocks stand in the way of countries achieving this framework. The main challenges have to do with insufficient and uncoordinated donor funding, lack of inter-ministerial coordination, and the sheer effort involved in keeping such a holistic and multidisciplinary framework internally consistent and updated.

Donor assistance to improve national infrastructure frameworks is patchy and with inconsistent intent. Bilateral donors may perceive such assistance as risky because improving policy and legal measures, such as the enabling environment, may not produce tangible results in the form of projects that benefit their domestic enterprises. MDBs and other multilateral organizations provide support in this area, through policy loans and technical assistance, though they tend to be ad hoc and uncoordinated. Sector reform templates are frequently repurposed from one country to another year after year with little change. Some push for reforms for ease of doing business, while not being mindful of the adverse impacts of such reforms on protection afforded to workers and the environment. Little effort is made to help countries achieve a comprehensive and holistic infrastructure framework with focus on sustainable development and attainment of SDGs. These are ongoing challenges for MDBs' programs that purport to improve enabling environment for private investment. As for PPFs, they were traditionally used to fund project-level activities and not policy, so that they are mostly not a viable source of funding for creating an infrastructure framework.

The components of an infrastructure framework must address a large collection of topics in multiple disciplines and avoid gaps. Some of these tasks are delicate and challenging to address. For example, in

Chad, Myanmar, Niger and Tanzania are currently designated as LDCs. Furthermore, 31 do not publish infrastructure plans (40%) and 23 do not publish infrastructure pipelines (30%). InfraCompass notes that these countries can increase the prospect for infrastructure investment by publishing these key planning documents.

countries where dominant and inefficient state-owned enterprises exist, these enterprises must be reformed to entice private participation in infrastructure, which is a politically and socially delicate task. Yet, without such reforms, investors will avoid investing in the sector. Similarly, where land law and land registration systems are ineffective, land acquisition often becomes a significant bottleneck, prompting investors to consistently rank land acquisition risk as high risk. Land reform and functional cadastral system will be necessary to help speed up acquisition of project land and resettlement and compensation of people. Moreover, absence of land use policy and land use planning could seriously slow down implementation of infrastructure projects.

Achieving sustainable development means regulating or providing guidance on topics such as climate change, environmental protection, jobs, gender equality and other human rights issues as they relate to infrastructure, requiring coordination among multiple agencies. The legislators must also ensure that the components of the infrastructure framework and the existing domestic policy and legal instruments, as well as the country's international commitments, are consistent. This could be a complex task that could take government officials in charge of infrastructure outside their areas of expertise.

Even a well-designed infrastructure framework cannot stay static. Older infrastructure frameworks need to be updated to be compatible with the latest national policy (see Box 6), and constant adjustments are needed to respond to domestic and international changes.

One real example of a policy-level challenge is how to regulate unsolicited proposals from the private sector. Such proposals frequently assert swift solutions to the dire needs of the host country, often touting exclusive intellectual property and know-how of the proponents. These arrangements can be an easy way out of planning, allowing projects to reach financial close sooner and with less effort. Unfortunately, the potential downsides of unsolicited proposals include conflicts of interests, lack of competition, corruption, and lack of transparency and accountability. They could side-step many of the safeguards in place in a PPP arrangement, especially transparency. As a result, many jurisdictions end up setting high and possibly unrealistic standards for unsolicited proposals, which may also be side-stepped in practice.

Templates and documents should be standardized by incorporating international good practice on sustainable infrastructure. In this process, countries should guard against one-sided practices that favor investors at the expense of the host country. For example, many of the traditional legal boiler plate provisions in investment contracts are being revised in order to better balance the interests of the host state and investors (Aizawa and Mann 2021). Increasingly, SDG investors are asking pertinent questions about

Box 6. South Africa's efforts to update the PPP Framework

South Africa's comprehensive PPP framework is often recognized as the most advanced on the African continent, having attracted 34 PPPs totaling \$89.6 billion since 1999. But the pace of PPP activities slowed in the last decade, with the country's PPP framework barely closing one PPP a year. PPP projects are routinely delayed and cancelled. As a result, South Africa requested a review by the World Bank of the framework, which has not been updated in over 15 years. Areas of focus include the PPP framework, including institutional arrangements, the PPP manual, the municipal PPP framework and associated guidelines, and international best practice and lessons learned. The objective of the review is to increase the number of South African PPP projects.

Source: <https://cpccs.ca/projects/south-africa-reviewing-ppp-framework/>

indicators to show positive SDG impacts and responsibilities associated with data collection to support the indicators. Careful use of international expertise can ensure that the standardization tools meet the demands of investment in sustainable infrastructure and ultimately benefit the host country.

c. Project-level challenges

Project preparation is less robust in regions such as North Africa, Sub-Saharan Africa and Middle East, compared to the OECD countries. In Africa, 80% of infrastructure projects fail before feasibility due to limited dedicated funding for preparation and capacity inadequacies (OECD 2021). Governments in these regions generally need technical assistance in project preparation but many cannot allocate sufficient financial resources to it; naturally, they look to donor funds, but bilateral and multilateral donors are understandably cautious about using official development assistance on projects that appear to have a low probability of moving forward. Donor fatigue is sometimes a factor in this cautious approach. The result is a cycle of inaccessibility of donor funds for project preparation, leaving the country with a small or no pipeline of projects that are ready for preparation. As a result, even in Africa, where many PPFs are active and PPPs are slowly gaining ground, 70-80% of project preparation funding still comes from government budgets (Barker 2019). The problem of inaccessibility of PPFs is likely to be acute in LDCs and SIDS though this report found no dedicated research on whether and how these countries access project preparation funding.

Only a few studies examined the workings of PPFs, focusing on specific regions (e.g., Africa) or sectoral or thematic areas only (e.g., clean energy). Not surprisingly many studies point to the underfunded nature of the facilities and lack of financial sustainability. But topping up funding cannot even begin to address the challenges with the PPFs. Studies on PPFs have highlighted several common concerns about the operational aspects of the facilities, in addition to financing issues (G20 Development Working Group 2014; Nassiry and Nakhouda 2016; Leigland and Roberts 2007; Nassiry et. al. 2018; Oberholzer, et. al. 2018). They point to:

- inadequacy of human resources in view of their broad mandates
- concerns over preferring the interests of particular project investors over those of others
- lack of coordination across a myriad of small-scale initiatives
- deficits in sustainability, ESG or climate change content
- failure to address demand-side factors
- over-reliance on external expertise, insufficient rigor in analysis, and insufficient management or oversight of consultants
- lack of transparency

One study (Leigland and Roberts 2007) noted a problem with the weakness in the analytical preparation of infrastructure projects readied under PPFs, quoting a survey of 58 rail projects that found costs to be underestimated by an average of 45% and future demand overestimated by an average of 51%. This may suggest poor oversight of consultants hired with PPF funds leading to wasted resources and diminished benefit to the host country.

Another study of the African and Asian PPFs conducted by the Australian G20's Development Working Group recommended the PPFs to 'move towards approaches to country specific sector diagnostics and project

prioritisation the outcomes of which can be utilised by other MDBs. . . and prepare projects so as to maximise financing options including through having an “open access” approach to possible sources of funds’ (G20 2014).

In summary, countries would benefit from an expanded and more holistic range of assistance through PPFs, especially in the upstream phases. The upstream political and policy-level measures, such as institution and capacity building and improving the enabling environment and planning process, could help strengthen the project preparation phase that follows. In addition, a more open and flexible group of PPFs can provide a larger pool of funding and technical assistance without restricting countries to only one investor.

d. Challenges faced by international and regional organizations and donors

In the near term, financial contributions of donors and international organizations in support of developing countries’ infrastructure projects cannot be expected to increase significantly, given the shifting priorities of states, including urgent efforts to address the global pandemic. This means that the so-called infrastructure financing gap is not the only gap. There is also a serious gap in the financing of infrastructure project preparation. As noted above, the forecast is US\$4.7 trillion needed for project preparation costs between 2015 and 2030, or US\$188 billion annually. Even if donors redouble their efforts to replenish or expand the PPFs, the project preparation financing gap will not be filled in the foreseeable future.

With this limitation in mind, international organizations need to coordinate their efforts as much as possible to get more bang for their buck. The Global Infrastructure Forum, a collaboration organization for the MDBs, called for in the Addis Ababa Action Agenda, is positioned to play an important coordination role among the MDBs, though it seems to struggle to fulfill this role. For example, it does not consistently disclose consolidated data on infrastructure financing among MDBs, including the activities and costs associated with PPFs administered by the MDBs. Meanwhile, the UN Environment Management Group (EMG) has established a process to coordinate UN System-wide support for sustainable infrastructure, which is timely and welcome.

International discourse on sustainable infrastructure is dissonant, as described throughout this paper, where different organizations call for different priorities in infrastructure; for example, some seem to privilege private sector investment over public sector investment, while others stress quality infrastructure over quantity (though the QII initiative clearly aims for increase in quality private investment in infrastructure). Within the UN system, several initiatives on sustainable infrastructure exist, such as UNEP’s Sustainable Infrastructure Partnership and UNOPS’s Evidence Based Infrastructure initiative, yet, traditional measures, such as model PPP law reform, do not reflect the idea of sustainable development and coherence with the SDGs sufficiently. Multiple agencies are racing to set up potentially competing sustainability measurement indicators. Meanwhile, some countries are establishing their own sustainability principles for infrastructure investment, while others are proceeding to market their traditional infrastructure projects with little consideration for their sustainable development.

e. Sustainable infrastructure as a cross-cutting challenge

The approach to sustainable infrastructure entails integration of sustainability and SDG considerations from start to finish in the life cycle of infrastructure projects. From this point of view, the pathway of traditional

infrastructure projects and that of sustainable infrastructure projects are two parallel tracks that do not meet from inception to closure.

For projects to be developed and implemented as sustainable infrastructure, governments need to incorporate sustainability considerations deliberately at the start of the process. They are best raised and addressed during upstream project planning and design stages, be it the choice of fuel or technology in energy projects; nature-based infrastructure solutions; inclusiveness and accessibility; universal design; solutions to the ‘last mile’ problem, and so on. Once this window of opportunity closes, projects invariably travel down a fixed path. Changing tracks, whether changing project fundamentals or reconfiguring or retrofitting project components to obtain better sustainability performance, will be unappealing due to time and cost involved. Meanwhile, those sustainability challenges are being treated as add-ons and left to donors or community organizations to pursue, or otherwise find themselves at a dead end.

Institutional boundaries and policy differences create silos that stand in the way of information sharing and collaboration among key players. As a result, too many of the measures to fill project pipelines described in this paper neglect to address sustainable infrastructure or are indifferent to it. For instance, investment or PPP laws and regulations that create an ‘enabling environment’ are silent about the role of investment promoting the sustainable development of the host country or the need for investment to align with national SDG strategy and plans.¹² As illustrated by one study on PPFs that found only one-third of 36 PPFs reviewed took climate considerations into account (Nassiry and Nakhoda 2016), PPFs do not consistently include sustainability components.

Sustainability experts can be entrapped in their own silos too. For instance, ‘green’ infrastructure proponents claim they are sustainable, yet not all green projects are necessarily SDG compatible, or protective of human rights (Business and Human Rights Resource Center 2020). The technical expertise needed and the perception that integrating sustainability in existing project processes is difficult or expensive can keep sustainability experts in their own silos.

Resources that support sustainable infrastructure planning and development are numerous, as indicated by GIZ and UNEP Tool Navigator described above (also see IDB and Mercer 2016). Many would-be users are overwhelmed by the sheer number of tools and other resources that are available and do not even know where to begin. In addition, numerous initiatives that support would-be users provide technical assistance and capacity building, among other things. However, they are uncoordinated, and may keep a meaningful coalition of users from forming, prevent consistent market practice from developing, and result in fragmentation of the resources available to support these initiatives.

In addition to countries, public and private financial institutions can be powerful allies of such initiatives, as demonstrated by the partnership between IFC and the Equator Principles Financial Institutions since 2003, resulting in an association of 118 international banks from 37 countries. But similar market movement has

¹² For example, UNCITRAL’s Model Legislative Provisions on Public-Private Partnership, issued in 2019 (available at: https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-11011_mlpppp_e.pdf) missed the opportunity to clearly align with the SDGs beyond a cursory mention of SDGs at the top of the document.

yet to materialize for ESG investment or SDG investment, or for sustainable infrastructure. The lack of a singular, agreed-upon dominant initiative prompts others to jump in and remedy the problem with yet another new initiative. Without a common frame and language, duplication and redundancy are likely. Worse, it enables actors participating in infrastructure to ignore the sustainability dimensions of infrastructure with no consequences.

IV. Recommendations

As the global pandemic continues to loom over other crises of climate change, debt, and inequality, addressing one crisis at a time through traditional infrastructure when investors are reluctant to invest in the first place simply will not be an option. The benefits of sustainable infrastructure include the opportunity to simultaneously tackle a combination of challenges, such as climate change, the global pandemic, lack of access to services, and environmental degradation, among others (see Box 7). If the upfront financial burden appears worrisome to politicians, they should understand the life-cycle cost benefit of well-planned sustainable infrastructure. To claim these benefits, countries need not wait to ‘graduate’ from traditional infrastructure. They can leapfrog to sustainable infrastructure with a comprehensive infrastructure planning process that deliberately focuses on sustainable development and attainment of the SDGs, then follow the sustainability pathway for the identified pipeline projects. The pathway to sustainable infrastructure is open to all, including the LDCs and SIDS, as they embark on infrastructure planning to meet their own needs.

This final section explores ways to improve the measures at the political, policy and project levels that contribute toward sustainable infrastructure project pipelines. Although the challenges are numerous and complex, and no silver bullet can solve the challenges simply and swiftly, well-coordinated efforts of local, national, regional and international actors can make an appreciable difference. They can begin to realign existing measures toward the SDGs and sustainable infrastructure and scale up successful innovative programs on sustainable infrastructure.

Figure 6 summarizes the measures, challenges, and possible solutions recommended by this report.

Figure 6: Political-, Policy- and Project Level Measures, Challenges and Recommendations

Box 7. Zimbabwe’s Solar for Health Initiative

Zimbabwe’s social infrastructure services have historically been constrained by persistent energy shortages. Connecting the energy and health sectors helps the government improve universal health coverage through developing sustainable infrastructure. It ensures that social priorities (health) are addressed in combination with Zimbabwe’s important economic and environmental aspirations. As part of UNDP’s global S4H Initiative, Zimbabwe has installed solar PV systems in over 400 health facilities, benefitting 6,525,000 individuals across the country. The adoption of solar power by healthcare facilities in the country is an example of developmental leapfrogging, as Zimbabwe foregoes traditional and unsustainable practices for environmentally sustainable ones.

Source: UNEP 2021b

Type of measures to support pipelines	Type of challenges	Possible solutions
<p>Political:</p> <ul style="list-style-type: none"> • Strategic vision and stewardship of infrastructure planning process • Allocation of resources • Institution and capacity building 	<ul style="list-style-type: none"> • Conflict between political short-termism and long-term infrastructure agenda • White elephant projects • Insufficient capacity • Insufficient sustainable development consideration 	<ul style="list-style-type: none"> • Decoupling political processes from infrastructure through independent institutions • Improved programs that build deep-rooted and multi-disciplinary capacity in sustainable infrastructure
<p>Policy:</p> <p>Infrastructure framework with:</p> <ul style="list-style-type: none"> • Strategy and policy • Plans and pipelines • Laws and regulations • Procedures and guidelines • Standardized criteria, templates and model contracts 	<ul style="list-style-type: none"> • Insufficient donor support for infrastructure frameworks • No plans & pipelines or no disclosure of them • Insufficient internal coordination • Insufficient sustainable development considerations 	<ul style="list-style-type: none"> • Availability of funding for infrastructure framework • Transparent plans and pipelines • Stronger internal coordination for better integration of sustainable infrastructure decisions • Standardized criteria, templates and contracts aligned with international good practice in sustainable infrastructure
<p>Project:</p> <ul style="list-style-type: none"> • PPFs, PDFs and other technical assistance during project preparation, processing and approval 	<ul style="list-style-type: none"> • Insufficiently funded and fragmented PPFs • Narrow focus on projects, and insufficient support for upstream activities or sustainable development • Insufficient focus on LDCs and SIDS • Lack of data on PPF and PDF operation and effectiveness 	<ul style="list-style-type: none"> • Recasting PPFs as a programmatic facility with focus on upstream phases and SDGs • Better coordination between PPFs and PDFs • PPFs dedicated to the needs of LDCs and SIDS • Transparency of PPFs and PDFs and common metrics

a. Political-level recommendations: Innovative institutions and programs to build deep-rooted capacity

Political problems demand political solutions. Yet there are no assurances that political reform will help improve countries’ prospect for more sustainable infrastructure. Instead, this report recommends ways for decoupling political processes from infrastructure planning and delivery through: (i) innovative independent infrastructure institutions; and (ii) improved programs that can build deep-rooted and multi-disciplinary capacity in sustainable infrastructure.

- (i) Innovative independent infrastructure institutions

Several developed countries have experimented with delinking some aspects of infrastructure development from politics through independent infrastructure institutions. They help to banish white elephant projects and minimize political interference in infrastructure planning and delivery.

Infrastructure Australia, a statutory body established pursuant to Infrastructure Australia Act of 2008, functions as the nation's independent infrastructure advisor, providing research and advice to governments, industry and the community on the infrastructure investments and reforms relating to investment in Australian infrastructure. Among its achievements is the Infrastructure Priority List 2021 that provides a comprehensive infrastructure roadmap for the country, featuring 44 projects, prioritized according to its own assessment methodology from state-nominated projects and those proposed by the private sector to solve national infrastructure problems. The newly developed Sustainability Principles guide the Priority List projects (Infrastructure Australia 2021).

A similar entity, Infrastructure Victoria, operates at a state level in Australia. Its main output is the 30-year infrastructure strategy for Victoria that is updated every few years, using a transparent and consultative process. Such a process frees up the long-term infrastructure strategy from politics and encourages people's ownership of the project pipeline. It has been reported that people of Victoria have defended their strategy when a new government proposed changes to it.

Another example of institutional innovation in Scotland aims to establish a stable delivery mechanism through an institutionalized partnership between the public and private sectors to help the government deliver new community infrastructure and maintenance services over decades (see Box 8).

Nothing stops developing countries from replicating these innovative institutions. These experiments have been in place for a decade or more, with well-documented lessons of experience that can be evaluated. Of course, a political system that is already mature and garnered public trust is a prerequisite to these institutions thriving independently of political interference. And how to hold such independent institutions accountable to people will always remain a challenge everywhere.

- (ii) Building deep-rooted capacity through improved programs

Aside from the novel purpose and structure of these institutions, it is the embedded capacity in these and other institutions that will keep the national (or local) infrastructure planning and project preparation process functioning for years and decades. Deep-rooted and multidisciplinary capacity can help countries withstand

Box 8. Scottish Futures Trust's hubCos: delivering community infrastructure for decades

Since 2010, Scottish Futures Trust has been managing its hub Programme which has delivered over 200 community infrastructure projects via five regional hubCos. Each hubCo is a 20-year partnership owned 40% by the public sector and 60% by private sector companies chosen in an upfront competitive process. The hub Programme brings together local authorities, health boards and police and emergency responders together with private sector construction firms to form an innovative partnership to deliver new community infrastructure such as health centers, hospitals, schools, cultural facilities, care homes and public sector offices. It is a model that involves the private sector early on, on clearly defined terms and drives public service improvement through collaborative development of projects with a focus on net-zero carbon, and inclusive economic growth principles, among others.

Source: Scottish Futures Trust website; EKOS Limited 2021.

the chaos and lack of continuity from change in political cycles. As countries think about bolstering their capacity, they should be aware of new forms of capacity building programs that deliver essential skills over years and explicitly ask for assistance in specific areas, especially the upstream planning and pipeline creation process that integrate the SDG considerations. They should seek programs that reflect the latest pedagogical innovations and techniques of academic and professional organizations. Examples include deep dives on thematic areas, peer learnings, communities and networks of learning, learning by doing, internships that can apply learnings, and so on. These should be designed as multidisciplinary, multi-layered and multi-year programs. Prior to proceeding with capacity building, it may be advisable for donors and beneficiaries to jointly undertake a gap analysis to identify gaps in the country capacity to deliver sustainable infrastructure (see Box 9). They should examine how these programs complement and interface with others already in place.

Box 9. UNOPS tool to assess capacity for sustainable infrastructure

United Nations Office for Project Services (UNOPS) has a capacity assessment tool for infrastructure known as CAT-I. It is designed to help governments identify gaps in the capacity of their enabling environment to plan, deliver, and manage their infrastructure systems. According to UNOPS, the tool can be used to develop a pipeline of projects to build national, state, city, or ministerial capacity using technical and advisory services.

Source: <https://cati.unops.org/>

b. Policy-level recommendations: Focus on an infrastructure framework and plan for sustainable infrastructure

Many countries with large infrastructure pipelines and active private sector participation are adamant that success comes from their good quality master planning process within a clear and transparent national infrastructure framework. To this end: (i) dedicated funding should be available to help countries strengthen their national infrastructure framework and planning process aligned with the SDGs; (ii) countries should establish and disclose infrastructure plans and pipelines; (iii) countries should embrace a whole-of-government approach to infrastructure and strengthen internal coordination toward better integration of sustainable infrastructure; and (iv) countries should put in place standardized criteria, templates, contracts and indicators aligned with international good practice in sustainable infrastructure.

(i) Funding to strengthen national infrastructure frameworks

Donors should consider expanding existing technical assistance programs, including PPFs, to help countries strengthen their infrastructure framework. These should be holistic programs that cover the enabling environment, and the planning and project prioritization process (Phases 1 and 2 in Figure 2 above). Integration of sustainability principles and the SDGs into the planning process, by making use of the data from the National Voluntary Review process and the INFF can increase the chances that the pipeline projects will align with the SDGs.

(ii) Establishing and disclosing plans and pipelines

Once infrastructure frameworks, plans and pipelines are in place, they should be publicly available and publicized. Such disclosure could minimize some of the risks associated with unsolicited proposals if

proposals are made within the boundaries of an open infrastructure framework and plan. Countries could consider only accepting proposals that are compatible with the framework, using open selection criteria and require proponents to demonstrate at the outset the expected positive impacts on SDGs; in addition, the selected projects should report on actual impacts on SDGs on an ongoing basis.

(iii) Improved internal coordination for better decision making in sustainable infrastructure

Governments should strive to improve internal coordination and adopt a whole-of-government approach in order to arrive at common solutions for sustainable infrastructure challenges of the country. Coordination among line ministries and other ministries and agencies with responsibility for sustainability matters is key and should be promoted by the top political leaders. Internal coordination will also ensure a cohesive infrastructure framework from which policy, legal and regulatory instruments flow with a common purpose of achieving sustainable infrastructure.

(iv) Standardized criteria, templates, contracts and indicators

Finally, governments should establish standardized measures, including criteria, templates, contracts and indicators, that align with international good practice in sustainable infrastructure instead of replicating existing business-as-usual practice. Among other things, they should establish and mandate the use of a set of impact indicators and sub-indicators consistent with the SDGs and scaled to the project level. This should be part of a certification or verification system to demonstrate SDG impacts, and preferably common to all countries. The impact assessment methodology that has been proposed under UNECE's people first PPP concept is instructive (see Box 10). Several similar initiatives are ongoing, including the GISD Alliance's Impact Management and Measurement tool, expected to be launched later in 2021, and FAST-Infra's sustainable infrastructure label.¹³

Box 10. UNECE's People First PPPs and impact assessment methodology

The UN Economic Commission for Europe (UNECE) has been exploring ways to put people's interest first in PPPs. It recently proposed an evaluation methodology that would enable countries to gauge a proposed PPP project's alignment with the SDGs. The methodology can also be used for projects' self-assessment as well as for a future certification scheme. If a similar approach were to be adopted by other UN regional commissions, it would strengthen the viability of such a scheme.

Source: <http://sdg.iisd.org/news/unece-launches-people-first-scoring-method-for-infrastructure-projects/>

c. Project-level recommendations: Rethinking PPFs

Donors and beneficiary countries alike deserve a better return on the investment in the PPFs. To this end, this report suggests: (i) recasting and aggregating PPFs as a program-level facility rather than a project-level facility with stronger focus on upstream assistance and SDGs; (ii) better interface between PDFs and PPFs; (iii) transparency of data on PDF and PPF performance and common metrics; and (iv) specific PPFs dedicated to the needs of LDCs and SIDS.

¹³ Finance to Accelerate the Sustainable Transition – Infrastructure, or FAST-Infra, an initiative that aims to raise the investment flow of sustainable infrastructure in developing countries, is a collaboration among IFC, OECD, Global Infrastructure Facility, Climate Policy Initiative, and HSBC. See: <https://www.sustainablefinance.hsbc.com/sustainable-infrastructure/fast-infra-a-public-private-initiative>

(i) PPFs as program-level facilities

Donors and administrators of PPFs should rethink the scope of assistance provided by PPFs in the following ways:

- Moving away from a single project focus to a program focus: A program could be a series of projects or a pipeline-, sectoral-, country- or regional-level program. Such a program focus could increase the efficiency of the assistance, promote consistency, and encourage sharing of strategies, studies and data among projects. This can lead to a reduction in the documentation requirements at the project preparation phase
- Moving away from fragmented PPFs, each tied to a single financial institution or donor to fewer and interoperable facilities among a group of donors or financial institutions: This may be possible between two or more PPFs operating in the same country or region, or PPFs with the same or related thematic areas. Smaller PPFs and some of the MDB facilities are good candidates for this exercise. This will expand resources and financing options available to countries and encourage information sharing
- Pairing upstream capacity building for infrastructure framework and project planning with project preparation assistance: For countries to realize a return on their efforts to prepare projects, they must first invest in project planning. PPFs should offer capacity building in these upstream phases as a prerequisite to project preparation assistance (see Box 11 for an example of a PPF that offers a full range of assistance)

Box 11. Global Infrastructure Facility's broad scope of assistance

The Global Infrastructure Facility is a partnership among governments, multilateral development banks, private sector investors and financiers. It enables collaboration in preparing, structuring, and implementing complex projects that no single institution could handle on its own. It offers assistance in the following four areas: (i) program definition/enabling environment; (ii) project preparation/investment feasibility; (iii) transaction design/implementation; and (iv) post-transaction/financing.

Source:
<https://www.globalinfrastructure.org>

(ii) Better interface between PDFs and PPFs

Since countries are spending significant amounts of their own funds for project preparation through PDFs, coordination between PDFs and PPFs should benefit both facilities. They can align objectives, eliminate duplications, ensure robust oversight of consultants, and maximize the return on the funding for both donors and beneficiaries.

(iii) PDF and PPF data and common metrics

To collaborate with PDFs, more country data on PDFs will be helpful for PPFs and vice versa. As a matter of priority, PPFs should collect and disclose data on their operations. This will also help ensure that key data and studies, such as sectoral analysis, strategic impact assessments and other similar materials, are shared among the PPFs operating in the same country, region or thematic area. Transparency of operations will aid the

analysis on their efficacy and can contribute to the creation of common PPF performance metrics. Similar measures may also help improve PDF operations.

- (iv) Specific PPFs dedicated to the needs of LDCs and SIDS

There is an urgent need for PPFs dedicated to the special needs of LDCs and SIDS. These facilities, whether new or modified, should prioritize capacity building over assistance with projects, and encourage proposals for smaller or pooled projects, which have been tried with some success in the renewable and water sectors.

d. Role of international and regional organizations and donors: Supporting countries' needs for sustainable infrastructure

In their supporting role, international and regional organizations and donor countries should consider how to maximize the impact of policy and project-level measures they support in order to facilitate beneficiary countries' expansion of pipelines of sustainable infrastructure projects. In addition to advocating for more financial and human resources for the PPFs and related activities, this report recommends that these organizations and donors: (i) coordinate and consolidate efforts to better promote sustainable infrastructure; (ii) review respective PPFs and coordinate with other PPFs and PDFs; (iii) focus on LDCs and SIDS, especially those countries that need planning assistance most; (iv) provide space to collaborate with the private sector in relation to planning and pipeline creation, such as the establishment of independent infrastructure institutions and management of unsolicited proposals; and (v) collect and publish data on PPFs and related assistance and establish measurement indicators of effectiveness.

It should be apparent to the international community that the current supply of funding for project preparation in developing countries is easily dwarfed by the massive projected demand. In view of this state of affairs, and as countries shed the effects of the pandemic and start to focus on infrastructure, both donor and recipients should strive to maximize the positive impacts of available funding while seeking for additional sources of funding. According to the Global Infrastructure Hub, countries may access assistance in capacity building and project preparation from new sources. One of the outcomes from the recent strain on multilateralism is the prominence of bilateral financial institutions, and especially export credit agencies (ECAs). ECAs are starting to provide support upstream of their usual point of intervention and looking at ways to contribute to project preparation, which will in turn support their national industries. It would be ideal if such bilateral assistance fit into the overall improvements on PPFs recommended in this report.

- (i) Coordination and consolidation of sustainable infrastructure efforts

As mentioned above, funding deficiency is only part of the challenges faced by developing countries. As a matter of priority, all organizations concerned with infrastructure development should work together to ensure broad uniformity of message, and coordinate and consolidate existing measures on sustainable infrastructure. Priority areas include a common definition of sustainable infrastructure; standardized templates that reflect international good practices; common impact measurement indicators that can be used by host and home countries, financial institutions, and private project proponents; sharpening the focus of PPFs on sustainable infrastructure; and dissemination of good practices and case studies.

(ii) Better coordination among PDFs and PDF-PPF interface PPFs

International organizations and donors that support PPFs should consider how countries can get more out of them (see the project-level recommendations on PPFs above). The Global Infrastructure Forum should take on the task of analyzing the MDBs' PPFs and propose improvements recommended in this report, including a potential collaborative arrangement that could expand the pool of available financing. The Forum or the Global Infrastructure Hub could establish a framework or protocol for the smoother interface between PPFs and the PDFs to ensure maximization of efficiency and benefits for projects.

(iii) Focus on LDCs and SIDS

The needs of LDCs and SIDS must be prioritized. International organizations and donors could consider dedicated facilities for the planning and pipeline creation processes. Those countries that are currently without a national plan or master plan in any infrastructure sector, or those that do not publish them (see the list of seven countries in footnote 5 above) are in urgent need of first-generation plans and effective platforms to disclose and publicize them. Countries with no prior experience in pipeline planning could work with international organizations or donors to implement a simpler project prioritization and selection methodology.¹⁴ These facilities can also help LDC and SIDS gain experience and establish track record in planning for and implementing small scale projects or pooled projects. Moreover, such facilities could finance strategic impact assessments for LDCs and SIDS in order to simplify and accelerate the process of project-level environmental and social impact assessments.

(iv) Collaboration with the private sector

Since countries drive planning, pipeline creation and project preparation, private sector participation in these early phases is limited; nonetheless, international organizations and large PPFs could potentially play a useful role in creating a space where private and public sectors collaborate with integrity in strategic areas. For instance, international organizations or PPFs can work with countries to replicate the independent infrastructure institutions that exist in some developed countries. These institutions reserve specific roles for the private sector, such as direct proposals from the private sector in the course of infrastructure planning. They can

Box 12. Global Infrastructure Facility helping with unsolicited proposals

The São Paulo State Government had received several unsolicited proposals for the \$2.5-billion, 130-kilometer São Paulo Intercity Rail Line. The GI Facility helped review the proposals, made a high-level feasibility assessment, and provided recommendations for the transaction, focused on improving the affordability of the project, and ensuring the institutional leadership and coordination necessary to take the project forward as a government-led initiative. As a result of this support, the Facility is now providing follow-up assistance to help the government implement the recommendations.

Source: www.globalinfrafacility.org

¹⁴ For example, the Infrastructure Prioritization Framework proposed by Marcelo, et. al. (2016) is a quantitative multi-criteria prioritization approach that synthesizes project-level financial, economic, social, and environmental indicators into two indices – social/environmental and financial/economic – and considers these alongside the public budget constraint for a particular sector. It is a simpler method compared to the traditional approach involving financial analysis, cost benefit analysis, and environmental and social impact assessment, which may produce outcomes that do not necessarily point to clear winners. Such an approach may be suited to countries that are being introduced to infrastructure planning and prioritization for the first time. This methodology was reported as being piloted in some World Bank projects.

also help countries manage unsolicited proposals (see Box 12) and evaluate the proposals' contributions toward the SDGs.

(v) Collection and publication of PDF/PPF data

To achieve these outcomes, all relevant organizations should collect and publish data on PPFs and PDFs to allow an adequate evaluation of the facilities. The Global Infrastructure Forum could do much more with data collection, aggregation, and publication, as well as leadership in setting out common measurement indicators of effectiveness.

e. DESA's role

In view of its mandate to support countries to unlock financing for the 2030 Agenda and the SDGs, DESA is uniquely placed to convene key stakeholders in a dialogue on ways to assist countries' efforts to expand sustainable infrastructure project pipelines. In addition to taking on the inter-agency coordination role for the Addis Agenda, it is sponsoring or supporting several relevant initiatives, including the SDG Investment Fair and the GISD Alliance. As such, DESA could pursue several recommendations noted in Section IV.d. above and concretize and implement them. The following section explores DESA's potential role in the report's recommendations. Through these activities, DESA can also help developing country officials charged with infrastructure pipeline to network informally and make important connections with financial institutions and experts from around the world.

(i) Promotion of sustainable infrastructure

A dedicated session on planning for sustainable infrastructure project pipelines may be helpful during or in the margins of a future SDG Investment Fair event. Important lessons learned from pioneer countries that engaged in such a process (such as St. Lucia, Singapore and Zimbabwe) are starting to become available, and these could form useful core materials for an in-depth substantive session on a topic of key importance in pipeline creation (see Section IV.d.(i)).

(ii) Facilitation of PDF and PPF coordination

DESA could convene a series of discussions around the PPFs among the MDBs, other administrators of PPFs, interested GISD Alliance members, and country representatives. Topics could include common rules of engagement for PPFs, consolidation and interoperability, improving coordination with PDFs, data collection and impact measurement (see Section IV.d.(ii) and Section IV.d.(v)).

(iii) Private sector participation

Similarly, such a dialogue series could also usefully be organized among the GISD Alliance members on the topic of private sector participation in the process of infrastructure planning and making proposals (see Section IV.d.(iv)).

(iv) Responding to the needs of LDCs and SIDS

DESA could consider featuring some of the reformer countries, such as Rwanda, Mali, Guinea and Togo (who are the Infracompass 2020 top performers in the low income country category) in the SDG Investment Fair. These countries can make 'pitches' to investors and answer questions and receive constructive critiques, as it was done successfully in the April 2021 Investment Fair. Future Investment

Fair sessions could also organize peer-to-peer learning sessions among LDCs and SIDS representatives, who could be ‘coached’ by peers as well as experts from the GISD Alliance group (see Section IV.d.(iii)).

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