

Industry Agenda

African Strategic Infrastructure Initiative Managing Transnational Infrastructure Programmes in Africa – Challenges and Best Practices

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Foreword

Increasingly, political leaders around the world share a common vision of regional integration – to open up regional markets, link production clusters in different countries, facilitate the free movement of goods, services and people, and foster political stability and peace. Accordingly, a further common ambition is to promote transnational infrastructure as a physical backbone of this regional integration, and initiatives are under way to give greater priority to cross-border programmes.

In Africa, for example, the Priority Action Plan of the Programme for Infrastructure Development in Africa (PIDA PAP) encompasses 51 programmes of regional importance in the transport, water, energy, and information and communications technology (ICT) sectors, with an investment need of \$68 billion. The aim has been to get these programmes implemented by 2020, but the realization of that aim is hampered by the tremendous challenges the programmes face, often because more than one country is involved. Although these challenges might arise in any region, they are particularly severe in Africa. The continent is so heterogeneous – with 34 official languages, in addition to a plethora of local tongues, and more than 40 currencies, with great variation in the financial capacities of individual countries. Moreover, the maturity of public institutions remains inadequate, and serious shortcomings persist in the capability of and capacity for managing transnational infrastructure programmes.

We are delighted to introduce this second report as part of the activities of the World Economic Forum's Business Working Group on Infrastructure in Africa. The Group has been created in 2012 by the World Economic Forum in partnership with the African Development Bank, the African Union Commission and the NEPAD Planning and Coordinating Agency and it has been working as a coordinated business voice to support infrastructure development in Africa and in particular help accelerate the Programme for Infrastructure Development in Africa (PIDA).

PIDA was approved by the African heads of state and government at their summit in Addis Ababa, Ethiopia, in January 2012, signifying high-level political buy-in and ownership of the programme. Developed by the African Union Commission in partnership with the United Nations Economic Commission for Africa, African Development Bank and the NEPAD Planning and Coordinating Agency, PIDA specifically calls for new models of partnership between business, government and donors to implement the 51 Priority Action Plan (PAP) infrastructure transnational projects already identified.

This second report of the Business Working Group, "Managing transnational infrastructure programmes in Africa – Challenges and best practices", identifies the key hurdles that have to be overcome. It also presents a best-practice framework to guide policy-makers, sponsors and managers,

and to facilitate the delivery of transnational programmes, such as the ones included in the PIDA PAP, on schedule, at cost and at the right quality. These programmes can make a huge contribution to social and economic welfare by boosting transnational trade, connecting landlocked countries to world markets and by improving access to, and security of, electricity supply by linking large power plants with neighbouring countries.

We would like to thank the many World Economic Forum Partner companies and the many organizations which have generously contributed their expertise and time as members of the Business Working Group: A.P. Møller-Maersk, Arup, ABB, Absa Capital, African Rainbow Minerals, Anglo American, AngloGold Ashanti, ArcelorMittal, BT, Development Bank of Southern Africa, Eskom, Flour Mills of Nigeria, First Bank of Nigeria, General Electric, Industrial Development Cooperation of South Africa, Leighton Oando, Old Mutual, Overseas Infrastructure Alliance, Prudential, Royal Philips, Sasol, SNC Lavalin, Sun Group, Standard Bank, Standard Chartered Bank, Telkom SA, Transnet, UBS, United Phosphorus, Vale, Yara, Africa Capacity Building Foundation, International Finance Corporation, Mo Ibrahim Foundation, NEPAD Business Foundation, The Office of Gordon and Sarah Brown, The Infrastructure Consortium for Africa and The World Bank.

We would like to make a special acknowledgement of the leadership provided by our Partners, African Union Commission, African Development Bank and NEPAD Planning and Coordinating Agency. We thank them for their genuine, relentless interest and commitment to the activities of the Business Working Group.

The experience, perspective and guidance of all the above people and organizations substantially contributed to a number of remarkable discussions at the Business Working Group meetings in Johannesburg, Cape Town, Dar es Salaam and the World Economic Forum Annual Meeting 2014 in Davos-Klosters.

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Executive Summary

Increasingly, political leaders around the world share a common vision of regional integration – to open up regional markets, link production clusters in different countries, facilitate the free movement of goods, services and people, and foster political stability and peace. Accordingly, a further common ambition is to promote transnational infrastructure as a physical backbone of this regional integration, and initiatives are underway to give greater priority to cross-border programmes. In Africa, for example, the Priority Action Plan of the Programme for Infrastructure Development in Africa (PIDA PAP) encompasses 51 programmes of regional importance in the transportation, water, energy, and information and communications technology (ICT) sectors, with an investment need of \$68 billion. The aim has been to get these programmes implemented by 2020, but the realization of that aim is hampered by the tremendous challenges the programmes face, often because more than one country is involved.

Financial challenges exist, such as agreeing on the sharing of programme costs, risks and benefits, and then implementing agreements in the absence of a supranational authority; or structuring the financing with different currencies and different national financial capacities. Other challenges are technical (aligning different standards – the gauge width of a cross-border railway network, for example – and different operating requirements) and regulatory, including the provision and enforcement of legal agreements and the alignment of procedures. The human factor is present as well: the need to build relationships based on trust, to overcome historical legacies of political differences and to bridge language barriers. In transnational programmes, the number and variety of stakeholders is amplified, as is the cultural diversity of the teams. Finally, programme governance poses its own challenges: aligning different national agendas, and ensuring that all participating countries have appropriate ownership. It is difficult to coordinate

the responsibilities and processes across countries, and to overcome national interest in staffing. In addition, the multicountry setting increases the risk of (unilateral) political changes, and tends to delay decision processes even more. All of these challenges will vary in intensity, of course, according to the phase, size and complexity of a programme, as well as the enabling environments within the countries involved.

Although these challenges might arise in any region, they are particularly severe in Africa. The continent is so heterogeneous – with 34 official languages, in addition to a plethora of local tongues, and more than 40 currencies, with great variation in the financial capacities of individual countries. Moreover, the maturity of public institutions remains inadequate, and serious shortcomings persist in the capability of and capacity for managing transnational infrastructure programmes.

Finally, unlike the European Union (EU), for instance, Africa's Regional Economic Communities (RECs) lack the resources and the mandate to drive the implementation of such programmes. This concept paper presents a best-practice framework for the management of transnational infrastructure programmes in Africa. It is descriptive rather than prescriptive in nature, but the framework should help policy-makers, programme sponsors and managers to get their bearings, and will facilitate the delivery of cross-national programmes on schedule, at cost and at a high quality.

The various phases of a transnational infrastructure programme raise different issues. In the origination phase, the initial priority is to integrate the individual national infrastructure plans. To achieve that, the programme sponsors in the involved countries should devise a regional sector planning framework, with appropriate institutional arrangements. Given that the costs and benefits (both pecuniary and in externalities) of a cross-border infrastructure facility

are often distributed unequally across participating countries, it is important to conduct a regional cost-benefit analysis (CBA) in order to establish a regional business case. As a second step, the involved governments should take an aligned decision on the delivery model, and should harmonize their concession frameworks – ideally issuing a single concession for the whole facility rather than several concessions in each country.

When it comes to the programme's preparation phase, a bankable feasibility study is needed. Next, the costs, benefits and risks of the programme need to be carefully allocated to the involved countries. That work should be assigned to a strong, impartial and respected arbiter, such as a regional development bank. The arbiter would also develop a detailed compensation plan for those people adversely affected by the infrastructure programme. A further imperative during this phase would be to harmonize the regulations and technical standards across the various countries: as far as possible, existing national standards should be adopted, and regulations should be radically simplified.

Finally, during the implementation phase, a competitive, transparent tendering process and an optimal financing structure are required. In the Economic Community of West African States (ECOWAS) region, the procurement process has increased in transparency thanks to a procurement committee staffed by all participating countries and involving neutral experts. To secure the best financing structure, the programme sponsors should establish regional financing instruments and make use of risk-mitigating instruments such as guarantees. During the construction phase, the processes should be aligned across all participating countries, in order to ensure, for example, that different stretches of a railway track can be interconnected at the border as scheduled; or, that a cross-border transmission line is in place so that a new hydroelectric power plant does not remain unused.

The programme sponsors should also ensure that the operation and maintenance (O&M) of the infrastructure facility is properly coordinated across borders. This coordination is particularly pressing in cases where consumption and production are located in different countries, as necessary repair works will affect the supply of water, oil or electricity abroad.

Over the programme's entire life cycle, it is crucial to institutionalize cross-border collaboration. That task could be fulfilled by a special purpose public agency (SPPA), established through a special treaty between the countries. The SPPA could take various forms: a public consortium, a private venture, a public-owned private enterprise or a public-private partnership (PPP), in which the organization would be jointly owned by the public sectors of the involved countries and by the private sector. The agency would have overall accountability for the programme and ensure that it is managed coherently, rather than as individual projects. In addition, the SPPA should be issued with special rights. Over the programme's life cycle, its role would

change: it would be established only after the origination phase, but would then drive the preparation phase by conducting the technical, environmental, social and economic studies. (This task could be outsourced to an infrastructure project preparation facility [IPPF].) Once the preparation phase ends, and assuming the involved governments give the go-ahead for the programme, the SPPA would prepare the tender documents, select contractors and issue contracts. During the construction phase, the agency would supervise the construction process and ensure alignment across borders. (This task could be outsourced to a professional project management company; the SPPA's role would then be to supervise this contractor.) During the O&M phase, the agency would commission and supervise all maintenance processes and again ensure alignment across borders. Over the whole life cycle, the SPPA would be in charge of coordinating with all stakeholders of the programme, and would provide a single point of accountability.

For transnational infrastructure programmes to flourish, they also

need a conducive environment, which includes an appropriate regulatory system in all countries. Moreover, the environment should have the right management capacities and capabilities in the public sector (e.g. ministries and public agencies), as well as in national and regional finance institutions (e.g. development banks), parastatals (e.g. national utility and railway companies) and the programme management unit (e.g. the SPPA). A final crucial factor – good relationships between the relevant parties – requires trust, and the investment of time and effort in building those relationships. Institutions, treaties and agreements can support bilateral and multilateral cooperation, but they are no substitutes for trust.

The relevance and applicability of the various best practices has to be determined on a programme-by-programme basis. Adopted and applied appropriately, they should remove roadblocks to the realization of regional infrastructure programmes, and help to make PIDA a reality – with all its associated benefits, such as improved public health, a boost in local prosperity and greater regional integration.





Introduction

Transnational infrastructure programmes have been difficult to establish in the past because of intercountry rivalries and the fear of invasion.¹ With increasing democratization and globalization, however, attitudes have changed dramatically. Around the world, political leaders now share a vision of regional integration. Transnational infrastructure assets – not just in the transport sector, but also in energy, water, and information and communication technology (ICT) – are the backbone of cross-border exchange of people, goods and services.

Recognizing the importance of infrastructure for creating regional markets, connecting production clusters in different countries and linking these clusters with markets, governments around the globe have recently taken many initiatives to pursue infrastructure ventures with their neighbours. In Europe, for example, the Helsinki Declaration of 25 June 1997 lays out a set of principles for a European transport policy,² while Articles 170-172 of the Treaty on the Functioning of the European Union provide the basis for trans-European networks in the transport, energy and telecommunications sectors.³ In South-East Asia, the Greater Mekong Subregion (GMS) programme oversees a portfolio of 58 projects, with an investment volume of \$26.5 billion in hard and soft infrastructure across Cambodia, the People's Republic of China (China), Laos, Myanmar, Thailand and Vietnam.⁴ In Africa, several organizations – the African Union Commission (AUC), the New Partnership for Africa's Development Planning and Coordinating Agency (NEPAD Agency) and the African Development Bank (AfDB) – set up the Programme for Infrastructure Development in Africa (PIDA), with a Priority Action Plan (PIDA PAP), to be implemented by 2020, that covers 51 transnational programmes in the energy, transportation, water and ICT sectors.

When neighbouring countries agree to share an infrastructure project, they could be motivated by a variety of factors. On the one hand, geographical reasons could play a role; for example, a hydroelectric power plant might be located on a river forming the border between two countries. Economic reasons, on the other hand, can also figure, such as a highway or an integrated rail network that would facilitate trade between the countries involved; or, a large power plant that might become economically viable if nearby foreign countries contract to off-take an agreed amount of electricity. Furthermore, the diplomatic dimension exists; a railway bridge might serve not just as a bridge for trains, but also as one for fostering cordial bilateral relations.

One key characteristic of transnational infrastructure programmes is that the costs and benefits – both monetary and as externalities – occur in more than one country and are often distributed unequally. For instance, a hydroelectric power plant in country A might produce electrical energy mainly consumed in country B, while the dam involved causes irrigation problems further downstream in country C. Or, a transport network might connect industrial centres in countries A and C, while country B serves mainly as a mere transit country without major benefits. The challenge is to quantify the direct pecuniary costs and benefits and to put a value on the externalities, as well as to devise a scheme for distributing them fairly across the countries involved. In the meantime, as countries often remain concerned about not getting a fair share, or about providing a subsidy to a neighbouring country, the number of transnational projects remains well below the social optimum.⁵

In addition to assessing and allocating the costs and benefits, the organizations managing transnational infrastructure programmes face several

other challenges. Difficulties in the financing, technical design, regulatory environment and governance of these programmes exist, all the more so in view of the cultural differences often involved. The aim of this concept paper is to identify these challenges in transnational infrastructure programme management and their specific relevance to Africa, and to outline the best practices for addressing them. The findings are based on expert interviews and extensive research into previous transnational projects – the difficulties that these projects encountered, and the ways in which the difficulties were addressed and resolved.

This paper does not cover the challenges inherent in the physical construction of transnational infrastructure assets (from the perspective of an engineering, procurement and construction contractor, for instance); it remains focused on the planning and implementation process, the governance structure and the regulatory environment of a transnational infrastructure programme. The target audience includes programme and project officials in the public and private sectors, as well as policy-makers and government representatives in a position to influence the programme environment.



Drawing Some Distinctions

This section begins by defining the elements of any cross-border infrastructure programme and outlining its key characteristics, and then differentiates three types of programmes.

A Matter of Terminology

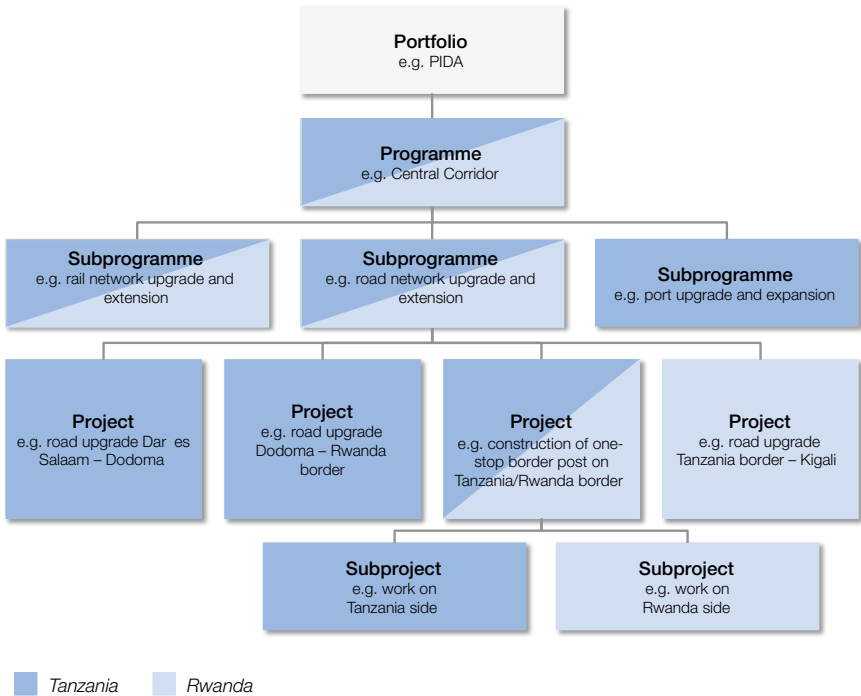
When the preparation and implementation of physical infrastructure is under discussion, three phrases are commonly used: an infrastructure project, an infrastructure programme, and an infrastructure portfolio.⁶ An infrastructure project is a specific and temporary undertaking, aimed at producing a defined structure – a new airport terminal, for example, or a water purification plant. The project has a clear timetable for delivery,

and a clearly defined output. An infrastructure programme is a group of closely related or interdependent projects, jointly planned and managed for greater efficiency – for example, a water distribution system, including a reservoir or dam; a water purification plant; and a network of piping and metering.⁷ The joint supervision enables specific benefits that would probably not emerge if the projects were supervised individually – benefits such as reductions in overall procurement and operating costs. An infrastructure portfolio is a group of loosely related or unrelated projects or programmes, jointly sponsored or facilitated at a high level, serving a broad strategic objective; for example, a regional healthcare upgrade, including a water distribution system and a network of clinics and hospitals. This distinction is well established in project management and engineering; however, the definitions are

not consistently applied in practice. For instance, PIDA is more characteristic of an infrastructure portfolio than an infrastructure programme.

The hierarchy of elements in a transnational transport programme are shown for the Central Corridor (Figure 1), which forms part of the wider PIDA portfolio.⁸ The Central Corridor programme can be divided into subprogrammes, according to the sector: rail, road and port. One or more different projects can be under each subprogramme, such as the upgrade of a road section or the creation of a one-stop border post. A transnational programme can generally be broken down into national projects, or subprojects if the infrastructure asset is located on the frontier, as with a one-stop border post or a bridge crossing a border river.

Figure 1: Structure of a Transnational Infrastructure Programme: An Example



Sources: World Economic Forum analysis

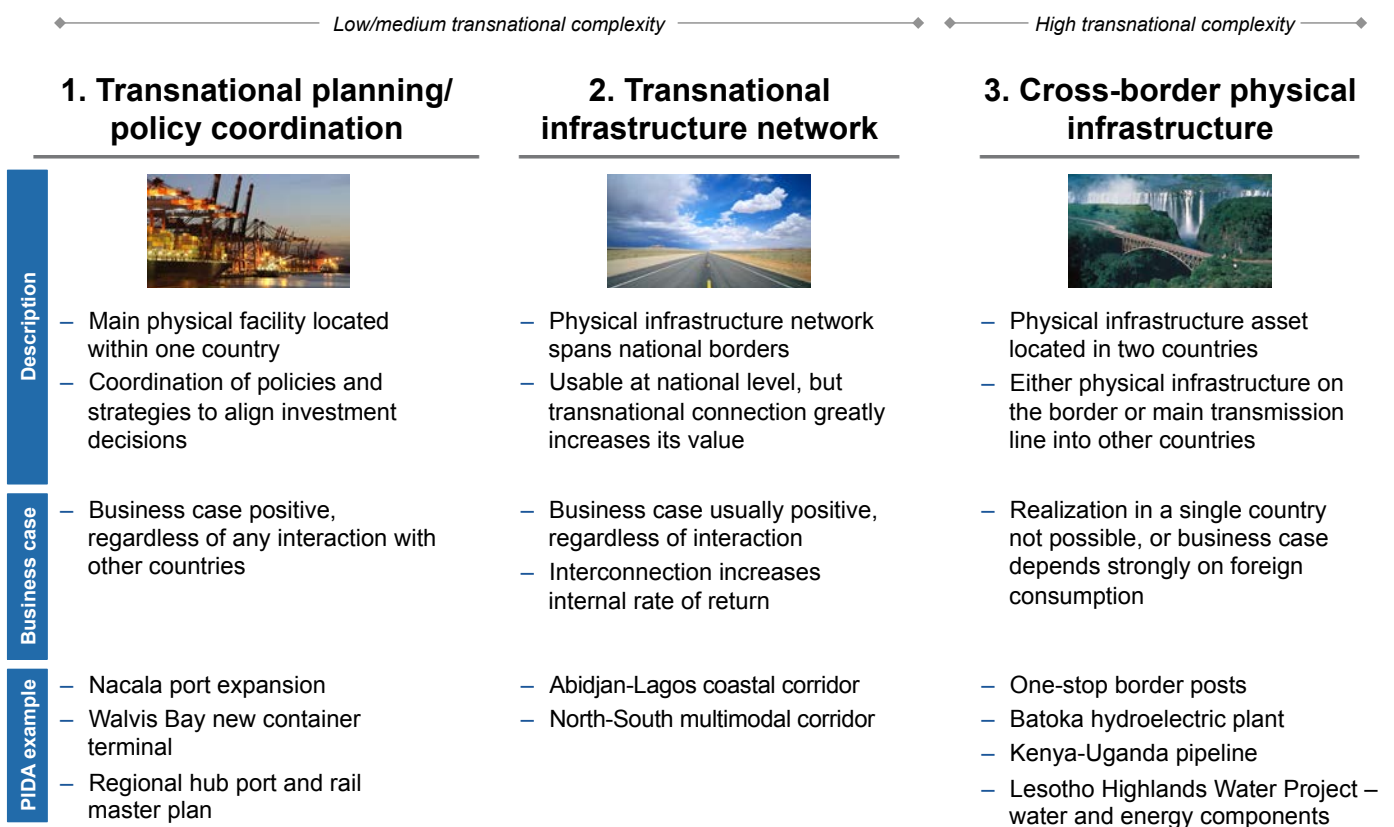
While such a structuring enables the management of the programme, it does not make programme management obsolete, as the specific benefits would remain unrealized if the projects were managed individually. Consider, for instance, the upgrades of the road sections from the city of Dodoma to the Tanzania/Rwanda border, and from the border to Kigali: they could be managed individually, of course, but that would forfeit the advantages, such as aligned work schedules, common technical standards and the joint procurement of supplies that will derive from the overarching management of the programme.

A Classification of Transnational Infrastructure Programmes

Transnational infrastructure programmes can be broadly classified into three different types, according to the degree of transnational collaboration needed (Figure 2).



Figure 2: Types of Transnational Infrastructure Programmes



Sources: World Economic Forum analysis



Very broadly, the transnational collaboration of the three types can be characterized as optional, preferable and crucial. The challenges grow increasingly complex with each type.

In type 1, or *transnational planning/policy coordination*, the infrastructure facility is located entirely within one country (e.g. a container port). The business case for such a project is positive, regardless of any interaction with other countries, but it is reinforced by the development of a joint strategy. The strategy, for example, allows for specialization, exploits economies of scale and reduces the likelihood of overcapacity. This type of transnational infrastructure refers mainly to “soft” aspects, such as legal, regulatory, procedural and other supporting policy frameworks, as well as to human and institutional capacities.⁹

In type 2, the *transnational infrastructure network*, the facility or network extends between two or more countries – a highway or railway system, for example.

The stretch that lies within any one country is usable and valuable in itself, but extra value is derived from the interconnections. In other words, the transnational whole is greater than the sum of its national parts.

Finally, in type 3 or *cross-border physical infrastructure*, the facility straddles two countries; or alternatively, much of its output is transferred across the border, as with a hydroelectric plant or an oil pipeline. The project depends on joint participation (it would be economically unviable if restricted to one country); or, the physical structure needs to be sited on two national territories.



Transnational Infrastructure Globally and in Africa

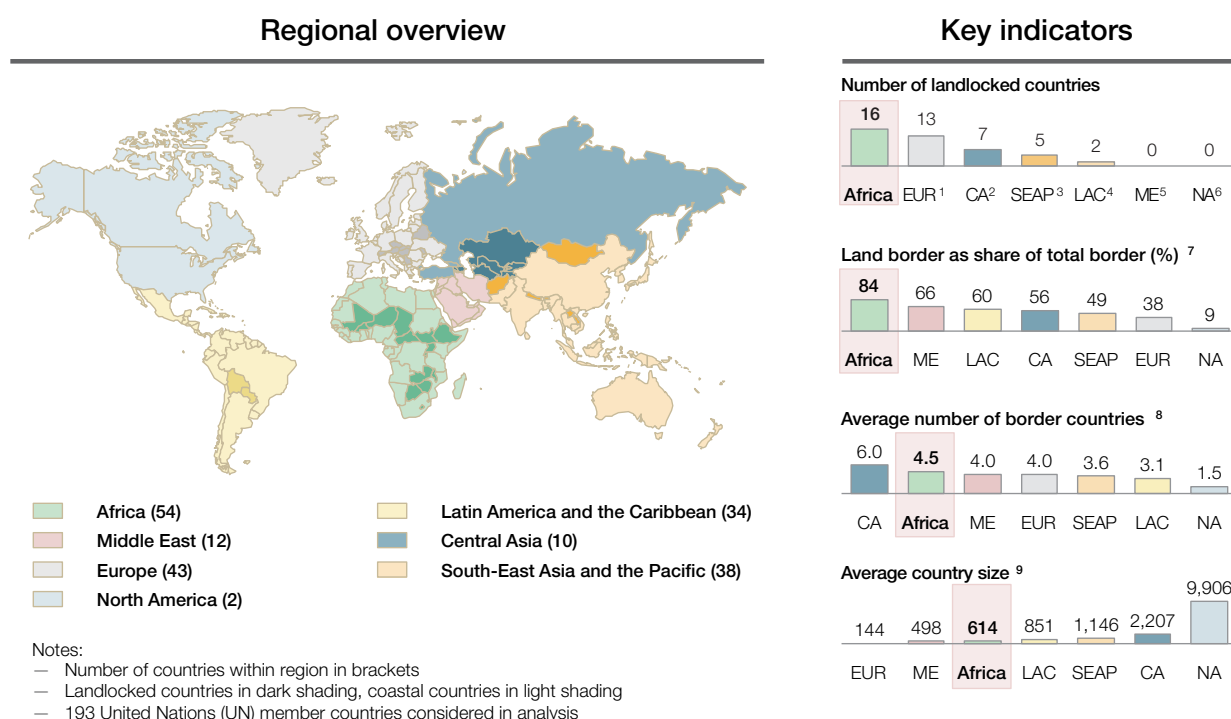
Two broad factors determine the need or demand for transnational infrastructure. The first is the spatial distribution of economic activity and natural resources, underlying the exchange of people, goods and services between economic clusters. Trade between two markets generally increases with their size, and decreases with the distance between them.¹⁰ If the markets are in different countries and cannot be served directly by ship or plane, the demand for transnational infrastructure assets arises. More specifically, if mining resources located in a landlocked country, such as copper in Zambia and Zimbabwe, are needed abroad (for example, for furnaces located in China), a demand for pit-to-port infrastructure across borders clearly exists. Similarly, if energy is needed in one country (e.g. South Africa), but the best conditions

for a hydroelectric power plant are in another (the Mphanda Nkuwa project in Mozambique), demand for cross-national energy transmission arises.

The second broad factor is the geographical layout and political boundaries that determine the *need to build infrastructure across borders*. Four indicators to measure this need are listed on the right side of Figure 3 (none of them is sufficient on its own to explain the existence of or determine the need for transnational infrastructure; and, the indicators are interdependent and often directly related). The first indicator is the number of landlocked countries in a region: the higher the number, the greater the need for transnational (transport) infrastructure, since these countries need to be linked to world markets, usually through roads and railway lines to a port. The

next indicator is the proportion of land border vs the border's total length; since coastal regions can be easily served by ships, a large share of land border suggests the need to build road and rail links across borders. The number of border countries is the third indicator; the greater the number, the more opportunities a country has for connecting with other countries and, hence, the need for more transnational infrastructure projects. Regarding the last indicator, the average size of countries in a region indicates a smaller size would usually increase the desirability of cross-border transport, communications, water and energy networks for the sake of greater efficiency. Moreover, a smaller country would be less likely to contain more than one major economic centre, and hence more likely to need access to cross-border markets.¹¹

Figure 3: Key Indicators for the Necessity of Transnational Infrastructure



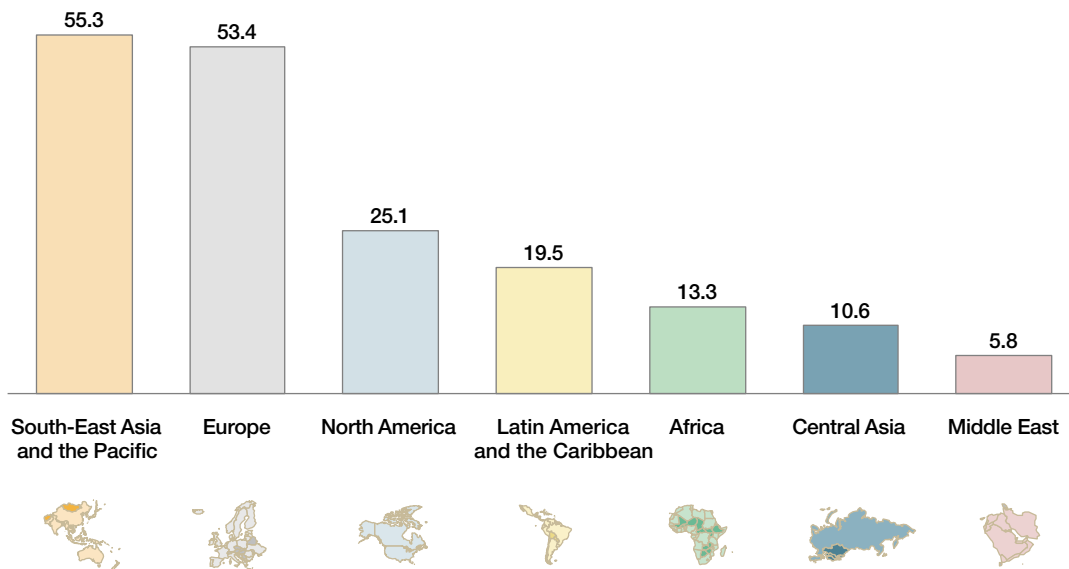
1. Europe 2. Central Asia 3. South-East Asia and the Pacific 4. Latin America and the Caribbean 5. Middle East 6. North America 7. On regional level – total length of all land borders/all land borders + coast (excluding islands) 8. Within region (excluding islands) 9. Within region, in '000 square kilometres (excluding islands)

Among the world's seven regions, Africa ranks first in the number of landlocked countries and in land border's share of total border. It ranks second in the average number of neighbouring countries, with 4.5 (first is Central Asia, mainly because of Russia's 14 border countries), and ranks third in average country size. Taken together, all the indicators point towards a strong need to build infrastructure projects across borders in Africa – a stronger need than in other regions of the world.

Despite this need, transnational infrastructure is still greatly underdeveloped on the African continent. Levels of intraregional trade are low, both cause and consequence of the missing interlinkages in transport: on the one hand, low traffic volumes render most transnational transport projects financially unviable and therefore difficult to find financing for; on the other, the lack of adequate transport facilities seriously hampers intraregional trade by significantly increasing trade costs.¹² Figure 4 shows intraregional

trade as a share of total intraregional and international trade for the seven world regions. With an average intraregional trade of 13.3%, Africa ranks only fifth – well below South-East Asia and the Pacific, Europe, North America, and Latin America and the Caribbean. Only Central Asia and the Middle East score lower, and in both cases, their overall international trade volume is even more inflated than Africa's by the export of natural resources (mainly oil and gas).

Figure 4: Intraregional Trade as Share of Total Trade, by World Region 2008-2012 (%)



Note: Total trade comprises intraregional and international trade; average for 2008-2012

Sources: Calculated from: United Nations, *UN Comtrade Database*, 2014

As mentioned, three prominent organizations – the AUC, NEPAD Agency and AfDB – recognized the need for transnational infrastructure in Africa and set up PIDA, which operates in four sectors (energy, transportation, water, and ICT) and has four key objectives:

- Increase energy access and reduce power generation costs
- Reduce transport costs and boost intra-African trade
- Ensure water access and food security
- Increase global connectivity

The Priority Action Plan of PIDA (PIDA PAP) covers a subset of 51 infrastructure programmes, to be implemented by 2020 and with an investment need of \$68 billion. The PIDA programmes were selected for

their regional importance and because they involve, directly or indirectly, more than one country. For the three types of transnational infrastructure programmes already described, the average number of countries involved is: 24 for transnational planning/policy coordination, 11 for transnational infrastructure network and 6 for cross-border physical infrastructure.¹³ From a sector perspective, the average number of countries involved is, for the energy sector: 6 for energy-generation programmes, 7 for transmission programmes and 3 for pipeline projects; and, for the transport sector: 14 for road programmes and 3 for rail programmes. Experience shows that implementing PIDA PAP is a cumbersome endeavour. Progress is often slower than anticipated, at least partly because of the very high number of countries involved in most of the programmes.

The origination, preparation, implementation and operation of transnational infrastructure programmes is hampered by a number of challenges – particularly in the African context. The next section provides an overview of these challenges, and outlines their specific relevance for the continent.










Key Challenges for Transnational Infrastructure Programme Management – and Their Specific Relevance for Africa

The management of a transnational infrastructure programme faces many of the same difficulties as managing any large infrastructure programme. Requirements for meeting the budget, quality standards and schedule are: capital expenditure needs to be minimized; the design of the programme should aim to optimize

value; rigorous risk management must be applied; contracting strategy and procurement needs to be refined; and scarce resources must be secured.¹⁴ However, some challenges are specific to transnational programmes or, at least, are aggravated by transnational aspects.

An overview of both types of challenges shows five categories: financial, technical, regulatory, personnel/cultural and governance-related (Figure 5).

Figure 5: Challenges of Transnational Infrastructure Programmes

 Financial	 Technical	 Regulatory	 Personnel/Cultural	 Governance
Challenges that <i>arise</i> from the transnational nature of a programme				
<ul style="list-style-type: none"> • Reach and implement agreement on sharing risks, costs and benefits • Optimize financing structure across countries with different economic capacities • Structure financing under different currencies 	<ul style="list-style-type: none"> • Align different technical standards • Align different operating requirements 	<ul style="list-style-type: none"> • Provide and enforce legal agreements • Harmonize different procedures 	<ul style="list-style-type: none"> • Build relationships based on trust, and overcome historical legacy of political differences • Overcome language barriers 	<ul style="list-style-type: none"> • Align different national agendas, and ensure ownership of programme in countries involved • Coordinate responsibilities within and between the participating countries • Overcome national interests in staffing • Structure supranational business unit
Challenges that <i>are aggravated</i> by the transnational nature of a programme				
<ul style="list-style-type: none"> • Manage greater demand and cost risks 	<ul style="list-style-type: none"> • Manage the technical complexity and construction risks 	<ul style="list-style-type: none"> • Manage the risk of regulatory changes in all participating countries 	<ul style="list-style-type: none"> • Coordinate a large number and variety of stakeholders with diverse interests • Manage a heterogeneous team 	<ul style="list-style-type: none"> • Manage the risk of political changes in all participating countries • Deal with inertia and lengthy decision-making processes

Source: World Economic Forum analysis

Financial Challenges

Four of the key challenges fall under this category:

1. *Get the participating countries to agree on sharing the risks, costs and benefits, and to implement the agreement*
The costs include those for project preparation, construction work and operating the facility throughout the life cycle. Revenue-sharing might be based on the countries' respective investments, and on the relative benefits the countries derive from the programme. However, measuring those benefits could be complicated, especially if the interconnection's value is much greater for one country than for the others, and if the calculation has to include not just pecuniary values but also externalities.¹⁵ Moreover, the multicountry setting could lead governments to adopt strategic behaviours that make it difficult to reach or implement agreements. This challenge is particularly common in off-take agreements for cross-border energy and water projects: how much of the output will each country buy during the project's life cycle, and at which price; and, how can the operator secure the countries' commitment to maintain that level of off-take? Conversely, how can the countries secure the operator's commitment to maintain or upgrade the facility and thereby guarantee continuity of output? The agreements will have to be binding yet flexible – a delicate balance.
2. *Establish an optimal financing structure*
Raising funds can be particularly difficult when multiple countries, and often multiple donors or lenders, are involved. The donors/lenders will tend to impose varying conditions, particularly when the participating countries vary in their creditworthiness. And, when the countries themselves contribute funding to the programme, how should a fair share be established, especially if they have very different economic capacities? Finding the right formula will be a complex task, which frequently delays the progress of transnational infrastructure programmes.
3. *Structure the financing when different currencies are involved*
Loans may have to be repaid in a

currency other than the one in which revenues are generated; contractors have to be reimbursed in more than one currency; or, revenues are collected in more than one currency – things are complicated enough at any given moment. The difficulties can be formidable over the project's entire life cycle, with fluctuating exchange rates and perhaps some very volatile currencies involved, especially since no appropriate hedging products are available. Risks stem not only from potential gyrations in exchange rates, but also from unexpected restrictions by governments on the free convertibility and use of currencies.¹⁶

4. *Manage the higher demand and cost risks*
With any infrastructure project, forecasting the use of a physical infrastructure asset and the associated revenue streams is difficult. However, if more than one country is involved, this difficulty intensifies owing to the potential heterogeneity of the catchment geography, as predictions have to be made for several economic areas. Similarly, with project costs: given that they are regularly underestimated in purely national projects, the risk is all the greater in cross-national projects, in view of the larger number of local subcontractors involved and the uncertain developments in various local material and labour markets.¹⁷

In the African context, these challenges are aggravated still further by the generally low levels of economic development, and the consequent difficulties in financing transnational infrastructure programmes. The low levels of economic development and internal trade tend to correlate with limited transport volumes and a limited ability to pay for electricity – limitations that hamper the financial viability of cross-national infrastructure programmes and make financing difficult. Furthermore, national governments often have little capacity to raise financing on the international capital markets. Only four African countries currently have an investment-grade rating: Tunisia, Botswana, South Africa and Mauritius (Figure 6). The asymmetries between neighbouring countries compound this generally weak financing capacity of national governments (some neighbouring countries have far weaker financing capacity than others), and further impede a suitable financing structure.

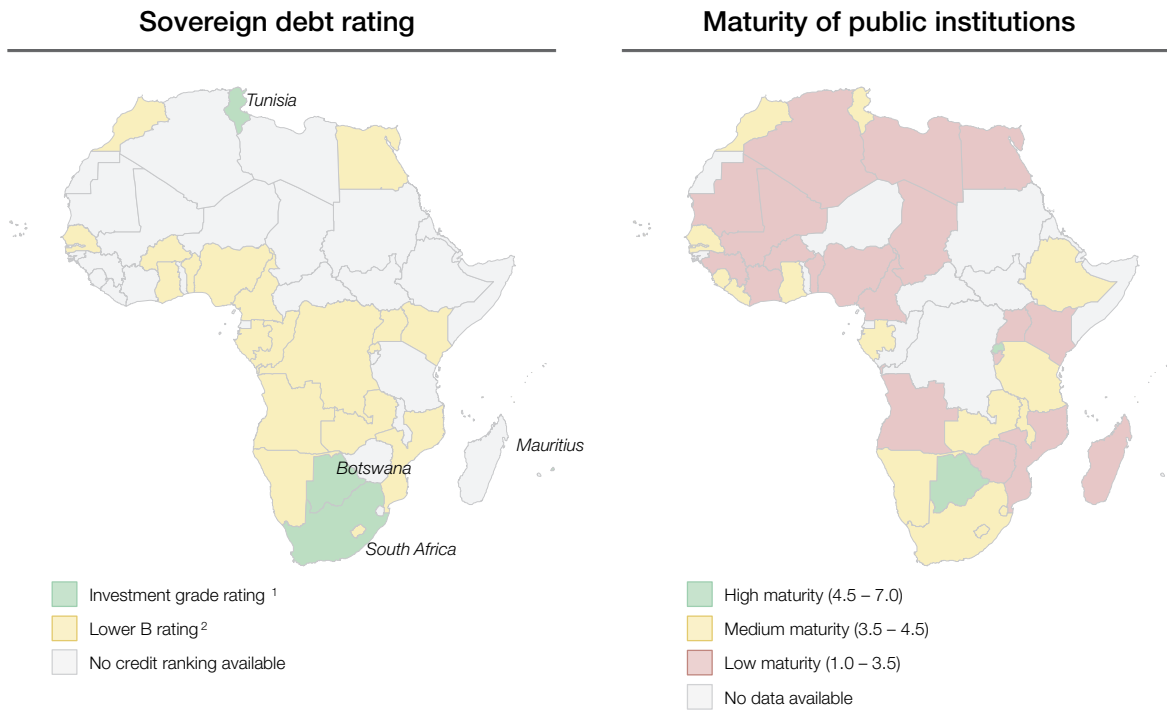
Weak balance sheets are typically registered by their public energy, water and transport companies. In addition, exchange rate problems are arguably more severe in Africa than in other regions of the world, with 40 different national currencies on the continent, most of which are extremely volatile.¹⁸ Finally, the donors and development banks that regularly help to finance infrastructure projects in Africa tend to have differing regulations, procedures and focus countries, and these inconsistencies add a further layer of complexity to financing transnational projects.

Technical Challenges

This category includes three of the key challenges:

1. *Align different technical standards*
The participating countries might have diverse and sometimes conflicting specifications and protocols – voltages, information technology (IT) systems, telecommunication networks, railway signalling systems and even railway gauges. These will need to be brought into some kind of alignment, either through standardization or conversion techniques (retaining different standards but ensuring they are compatible and interoperable).
2. *Align different operating requirements*
The design and set-up of infrastructure projects can be affected when the countries differ not only in their technical standards, but also in their operating requirements. Consider the maximum length of a train, the maximum axle load for trucks or the minimum rest periods for drivers and other transport personnel: continued misalignment of these operating requirements would restrict the efficient use of a transnational transport network. Another example is differing border post operating hours; until these are brought into harmony, the full benefits of a one-stop border post will remain unrealized.
3. *Manage the larger technical complexity and construction risks*
While managing such risks is a major challenge for all megaprojects, it is generally even more troublesome for cross-border projects, given the

Figure 6: Sovereign Debt Rating and Maturity of Public Institutions in Africa



1. From at least one rating agency (Standard & Poor's, and Fitch: BBB+ or higher; Moody's: Baa3 or higher) 2. Standard & Poor's, and Fitch: BB+ to B-; Moody's: Ba1 to B3

Source: World Economic Forum, *The Global Competitiveness Report 2013-2014*; Trading Economics, *Country List Rating/Economic Indicators/Data List by County*, March 2014

need to coordinate a larger number of different contractors and handle diverging technical requirements.¹⁹

In Africa, technical standards such as the rail gauge differ as a result of colonial history. For instance, most of the southern part of Africa uses cape gauge, while metre gauge is used in some countries in eastern and western Africa, and standard gauge is the predominant track gauge in northern Africa. These different technical standards complicate the interconnection of railway tracks across borders, and severely reduce network efficiency. Unlike Europe, where the European Community represents a strong supranational authority for driving the alignment of technical standards, Africa has no such authoritative body. The Regional Economic Communities (RECs) could play that role (Box 4), but they lack the power, capacities and capabilities to harmonize technical standards effectively.²⁰



Regulatory Challenges

Three key challenges fall under this category:

1. *Provide and enforce legal agreements*
Transnational infrastructure programmes require specific legal or regulatory agreements. Issues of national sovereignty arise, and are especially difficult to resolve when no common framework exists. If one country follows the English legal system and another the French, their national laws on any given topic might be difficult to reconcile. For a one-stop border post in the Economic Community of West African States (ECOWAS) region, for instance, the operating agreement took two years to negotiate. And for the Inga power transmission line, one of the agreements – between the Democratic Republic of Congo (DRC), Republic of Congo and Angola – necessitated three cabinet approvals and the alignment of three utility systems with different balance sheets. Even once the agreements are signed, the question of enforcement remains. It is sure to be hampered by the lack of a supranational authority.
2. *Harmonize different procedures*
The participating countries might favour divergent approaches to tendering and procurement, for example, and this misalignment could cause serious delays at various points during a project or programme. Similarly, border agencies might traditionally impose different clearing requirements on vehicles or travellers, and until these are brought into line, a one-stop border post could not function properly.
3. *Manage the risk of regulatory changes in all participating countries*
Regulatory changes are a risk factor in any long-term investment. The involvement of more than one jurisdiction simply multiplies the risk and the subsequent complications; consider, for example, if just one participating country decides to reduce or suspend road tolls on a transnational highway.²¹

These regulatory challenges are aggravated in Africa by the frequently modest showing in the maturity of

public institutions and the rule of law. In particular, countries in Central and northern Africa (Figure 6) rank low on this measure, according to the World Economic Forum's Global Competitiveness Report 2013-2014.²²

Personnel/Cultural Challenges

This category has three key challenges:

1. *Build trusting relationships, regardless of political or historical differences*
Contractual agreements are not enough to ensure smooth progress; the human factor is crucial as well. Trust is needed to open doors and deal with unforeseen obstacles, and troubled historical or personal relationships need to be set aside – not only between high-level political representatives, but also on the working level. Building trust is even harder if widely varying cultural values are involved.²³
2. *Overcome language barriers*
Language differences represent an ever-present potential problem. Beyond the anglophone, francophone and lusophone preferences is an abundance of indigenous African languages among programme workforces. In practice, language barriers are easier to overcome at the intergovernmental than at the technical working level, such as the daily interactions between site inspectors or passport officers. If accredited interpreters or translators have to be engaged, transaction costs will rise and progress might be slowed. But if they are engaged, the risk of misunderstandings will increase.
3. *Coordinate a large number and variety of stakeholders with diversified interests*
Any large infrastructure project is influenced by a large number of stakeholders from the public and private sectors, and also from civil society. To manage these different groups and to balance their interests will require great skill in project and programme management; this even more in the context of transnational infrastructure programmes, since they involve stakeholders from more than one country, enjoy a higher visibility and often have a larger

societal and environmental impact owing to their size.

Cultural challenges in transnational projects in Africa are heightened by the continent's tremendous diversity; as for language barriers, Africa is home to 34 official languages in addition to a plethora of lingua francas, local tongues and dialects.²⁴ Moreover, the continent has a long history of ethnic warfare, interstate conflicts and political unrest that hinders the establishment of trustful relations.

Governance-related Challenges

The final six key challenges fall under this category:

1. *Align the distinctive national agendas, and ensure all participating countries have appropriate ownership of the programme*
For a programme to realize its full potential, it needs dedicated political, technical and financial support from all participating countries; only in that way can they claim, and feel, proper ownership or commitment. That support might be hard to obtain if it fits uneasily with a country's national agenda; and, even if obtained, the support's continuity is always under threat, as a new government might downgrade its importance. Establishing support for a transnational programme appears to be particularly difficult where national assets such as railways and rolling stock are concerned. The European Commission (EC) reports that transnational network projects have been reduced to a low priority by some member states, and delayed by uncertainties associated with the planning processes and the complexity of coordination.²⁵
2. *Coordinate responsibilities within and between the participating countries*
Within any one country, the various processes and accountabilities related to the programme will be divided between numerous agencies or ministries, including the ministry of foreign affairs, the finance ministry, the environmental agency, and the departments of transport, energy and industry. The programme manager will have to coordinate these multiple contacts.

To make things even more difficult, the distribution of responsibilities is unlikely to be symmetrical in the participating countries; cross-border counterparts might therefore come from quite different backgrounds and be based in different agencies, and the programme manager might struggle to deal with them jointly.

3. *Overcome national interests in staffing*

In the run-up to an infrastructure programme, participating countries might occasionally aim to maximize their influence over it by getting their own citizens appointed to many key positions within the programme's organization. Such national interests could prove detrimental to the overall success of the programme, and should therefore be resisted. But that does not mean that a proportional representation system is the right approach either.²⁶ The correct approach is the best candidate principle, although sometimes it might have to yield slightly to diplomatic considerations. If national interests were to heavily influence staff selection, the programme organization might end up not only biased, but also lacking in the requisite capabilities.

4. *Structure a supranational business unit for the preparation, implementation and operation of the programme*

For the implementation of a transnational programme, a legal organization is required, which could take one of three different forms: an entity owned by the respective public sectors, a public-private partnership (PPP), or a private-sector company or consortium. Structuring such an organization will often involve coping with different laws, regulations and the lack of a supranational framework.²⁷

5. *Manage the risk of political changes in all participating countries*

Infrastructure projects necessarily involve the host country's public sector (e.g. as sponsor, co-owner, regulator), making the projects susceptible to political changes. The greater the number of countries involved, the more serious this risk becomes for transnational programmes.²⁸

6. *Cope with inertia and lengthy decision-making processes*
Megaprojects in the infrastructure

sector regularly involve a large number of different stakeholders, each of which might seek to influence the project's location, design and operation. At the same time, the stakeholders are under close scrutiny of the public, and decisions have to be taken at a high political level. Lengthy processes for decision-making may result, which can be slowed down further by having to align public- and private-sector interests, as well as civil-society concerns, not just within one but across the range of participating countries.²⁹

These regulatory challenges are even more pronounced in an African context. As discussed, the region – characterized by a large number of landlocked countries, a relatively small average country size and a large number of border countries on average – tends to have an unusually high number of countries participating in any transnational infrastructure programme. The Central Corridor, for example, directly involves five countries (Tanzania, Uganda, Rwanda, Burundi and DRC), and the West African Power Transmission Corridor involves seven (Guinea, Guinea-Bissau, Gambia, Sierra Leone, Liberia, Côte d'Ivoire and Ghana). At the same time, a dearth of capabilities in the public sector to manage large infrastructure programmes often exists.

These various challenges, however, are not independent of each other. One challenge can strongly influence the others; for instance, differing national agendas and a lack of ownership in a participating country could obstruct a proposed high-quality off-take agreement. Similarly, language barriers or a lack of trust could hamper negotiations on sharing costs and revenues.

Moreover, the relevance of each challenge differs from country to country, according to each country's economic, political, social and regulatory conditions; and, the challenges are not equally relevant for all types of infrastructure programme. As a general rule, the technical challenges are more relevant to those programmes in which the collaboration of two or more countries is indispensable, rather than merely efficiency-enhancing. Particularly at issue here are the type 3 or cross-border physical infrastructure programmes already described, where the infrastructure facility or fabric is

located on or crosses the border. One reason is that such projects typically involve just a single infrastructure facility, so costs and revenues cannot be easily split. Another reason is that these projects, by their nature, require joint technical standards and fully aligned operating requirements. By contrast, the set of governance-related challenges apply about equally across the three types of infrastructure programme, since all three rely heavily on national commitment and high-quality staffing.

Finally, and notably, the challenges might vary in intensity during different phases of a programme's life cycle (origination, preparation, implementation and operation). The challenges tend to be at their most intense during the preparation phase, which covers feasibility studies, technical design, financing and procurement. The reasons are that this phase is the most varied and most uncertain one, and that the contractual foundation is laid during the preparation period for the programme's entire life cycle: the planners need to establish a business case for the programme, broker agreements on the split of costs and revenues, secure financing and define technical standards. In the following phases, during construction and operation, the environment tends to be less volatile and risky; some serious challenges can still arise, of course – not least, the challenge of enforcing or adapting agreements if required. The very first or origination phase seems to be the least demanding, except for personnel/cultural and governance-related challenges: a promising programme might fall at the first hurdle because of inadequate trustful relations between the countries; or, one of the countries might be reluctant to commit to ownership, or conversely might be overzealous in claiming senior staffing positions for its own citizens.



A Best Practice Framework for Transnational Infrastructure Programme Management

To identify the best ways of responding to all the various challenges, the authors of this report undertook extensive research. This included conducting 12 interviews with experts from private companies, representatives of development banks and RECs, and consultants; reviewing the latest academic literature; and analysing numerous reports on transnational infrastructure projects published by the AfDB and the World Bank.³⁰ On the basis of the research, the authors modified the framework that had been developed in the World Economic Forum (2013b) report, *Strategic Infrastructure: Steps to Prepare and Accelerate Public-Private Partnerships*, to deal with the specific circumstances of transnational infrastructure programmes.

Presentation of the Framework and Overview of Best Practices

Figure 7 presents the framework of high-level best practices for managing transnational infrastructure programmes throughout their life cycles. In the origination phase, the priorities include integrating the national infrastructure plans with a regional infrastructure plan, and establishing a cost-benefit analysis (CBA) on the regional level to assess the programme's economic viability. As discussed later, it could easily be that a programme's negative effect in one country is outweighed by a larger, offsetting benefit in another. Such a

project would not be implemented without a regional CBA. The next step in the origination phase is to secure agreement among all participating countries on the programme's delivery model, and to establish a harmonized concession framework if a concession is issued.

In the preparation phase, it is crucial to develop a bankable feasibility study for the cross-national programme. Even more important is to allocate the risks, costs and benefits fairly to all affected countries, and to harmonize the regulations. For the implementation phase, the tendering process must be transparent and competitive, and the financing structure needs to take into account the specifics of a cross-border programme. Finally, during construction as well as operation and maintenance (O&M), the priority is to

align the processes and requirements across countries. The stabilizing framework for achieving all of these aims is a close and institutionalized multinational collaboration – one that covers the whole programme life cycle and provides a platform for securing alignment and taking decisions. In addition to these programme-specific best practices, a broader need exists; namely, a conducive enabling environment so that transnational infrastructure programmes can be efficiently identified, prepared and implemented. The elements of such an environment are: a rigorous regulatory system for transnational programmes; a set of the requisite capacities and capabilities for handling such programmes in each affected country; and a set of trustful relationships at both high political and working levels.

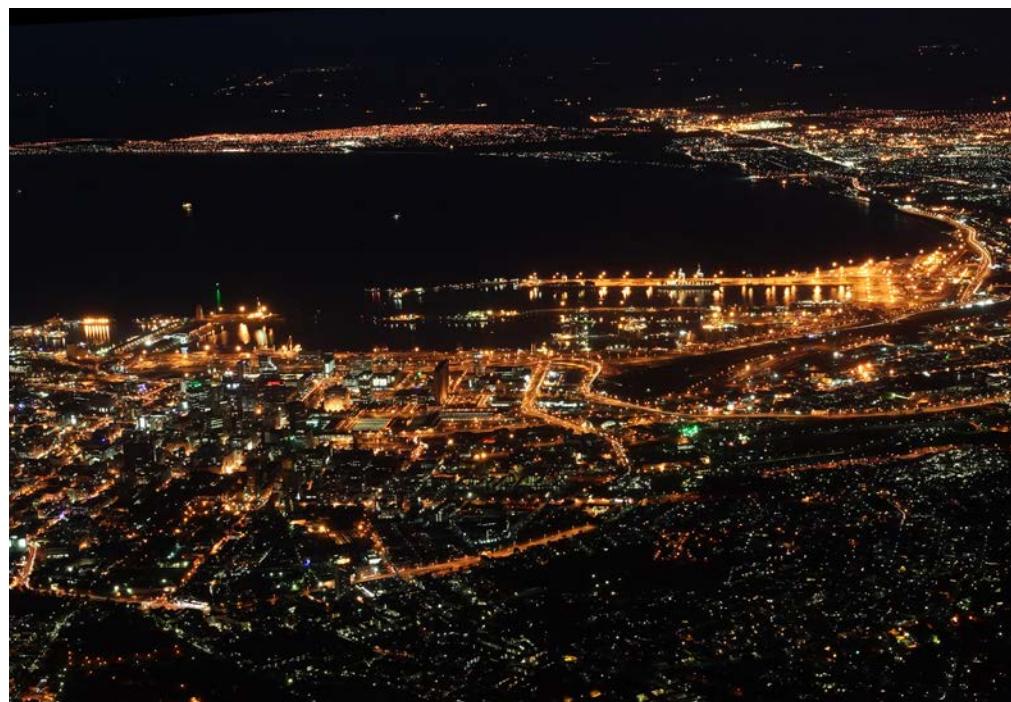
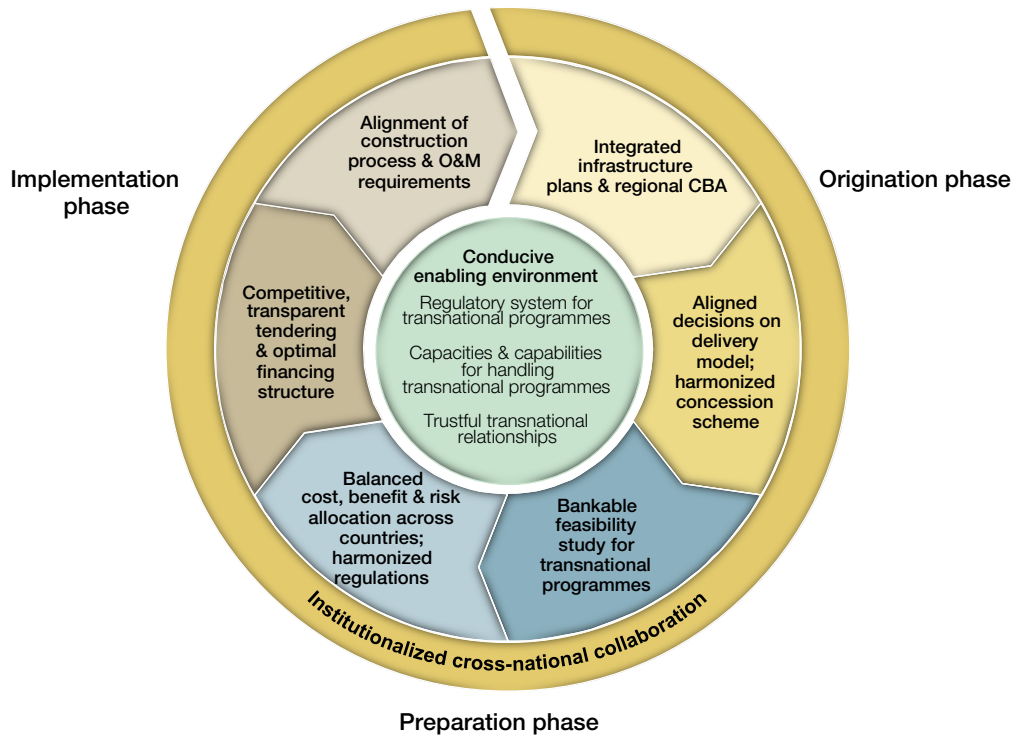


Figure 7: Best-practice Framework for Managing Transnational Infrastructure Programmes



Source: Adapted from World Economic Forum, *Strategic Infrastructure: Steps to Prepare and Accelerate Public-Private Partnerships*, 2013

Each of the framework’s high-level best practices is supported by one or several more specific best practices, summarized in Figure 8 and described further in some detail.



Figure 8: Overview of Specific Best Practices



Institutionalized cross-national collaboration

- Establish a strong unit for programme implementation and operation with special rights
- Arrange a fair representation of all participating countries in all governance bodies
- Distribute corporate activities fairly across all participating countries



Integrated infrastructure plans & regional CBA

- Establish a regional sector planning framework with appropriate institutional arrangements
- Establish a regional business case that includes all pecuniary costs and externalities
- Leverage regional development banks as a way of involving isolated regional areas



Bankable feasibility study for transnational programmes

- Develop a broad and flexible off-take agreement
- Remove revenues from national government control



Competitive tendering & optimal financing structure

- Set up a procurement committee that includes neutral experts
- Establish regional financing instruments
- Leverage risk-mitigating guarantees
- Reduce exchange rate risks by reflecting revenue currencies proportionally in financing structure
- Make use of purchasing-power-parity protection to insure against exchange rate risks



Conducive enabling environment

- Establish a single integrated framework for planning and designing transnational programmes

- Build strong relationships with all key stakeholders
- Agree on a single language
- Ensure high-level political commitment from each government, and highlight the value of communication
- Make early use of private-sector expertise

Aligned delivery model & harmonized concession

- Award a single concession

Balanced risk allocation & harmonized regulation

- Find and commission a strong, impartial and respected arbiter to apportion costs and benefits
- Harmonize and radically simplify technical standards, regulations and specifications, taking advantage of international models
- Regulate the programme through special treaties or a regional agency

Aligned construction, operation & maintenance

- Set up an expert committee to supervise construction
- In the off-take agreement, specify management protocols for aligning demand and maintenance requirements

- Build up dedicated capacities and capabilities
- Invest in building relationships based on trust

Source: World Economic Forum analysis



Institutionalized Cross-border Collaboration

As mentioned, one of the reasons why transnational infrastructure programmes are perceived as riskier than purely national ones is their increased complexity – the result of the need to coordinate planning, financing, procurement, construction and operation across borders. Coordination is difficult enough, and critical enough, for national programmes

when more than one public entity is involved (e.g. ministry, regulatory authority, public enterprise), and all the more so in a transnational setting. This is particularly the case in Africa, which lacks a pervasive sovereign jurisdiction such as the EC to align the differing interests of different countries and reduce transaction costs.³¹ Many of the challenges listed earlier can be overcome if the collaboration across countries works well and the right governance structure is found. Institutionalizing cross-border collaboration will not only facilitate the alignment across all programme




phases, but will also limit the risk of unilateral changes by one of the participating countries. Different levels of cross-border collaboration can be distinguished, according to their degree of sophistication: separate planning without coordination, separate planning with coordination, and institutionally integrated planning (Box 1).



Box 1: Cross-border Collaboration

Regarding cross-border collaboration, whether in a bi- or multilateral setting, three basic levels of coordination can be identified (Figure 9).

Figure 9: Three Levels of Cross-border Coordination

	Separate planning without coordination	Separate planning with coordination	Institutionally integrated planning
Description	 <ul style="list-style-type: none"> Each country has an individual planning process No alignment and coordination exist across countries 	 <ul style="list-style-type: none"> Each country has an individual planning process The planning is coordinated between the different countries 	 <ul style="list-style-type: none"> Countries delegate the planning to a dedicated programme unit Countries give up part of their national sovereignty
Bodies	<ul style="list-style-type: none"> No additional governance bodies 	<ul style="list-style-type: none"> Some kind of coordination body exists, e.g. interministerial secretariat or technical alignment forum Alternatively, supranational authority (e.g. RECs) could assume coordinating role 	<ul style="list-style-type: none"> Programme planning and implementation unit with special decision rights Alternatively, transfer of planning process to supranational authority (e.g. RECs)
Example	<ul style="list-style-type: none"> North-South Multimodal Corridor¹ 	<ul style="list-style-type: none"> Maputo Corridor Logistics Initiative 	<ul style="list-style-type: none"> West African Power Pool (WAPP)
Assessment	<ul style="list-style-type: none"> Not desirable, since programme is not managed as such Programme-level benefits are not realized 	<ul style="list-style-type: none"> Minimum requirement for reaping some programme-level benefits Risk of unilateral deviation from coordinated planning 	<ul style="list-style-type: none"> Potential to manage transnational infrastructure as a real programme Hard to realize, since national sovereignty is curtailed

1. The Memorandum of Understanding, which is between all participating countries of the North-South Corridor and would provide an operational framework, is still pending signature. However, progress has been made in implementing individual projects.

Source: World Economic Forum analysis

The first level involves separate planning in each country without formal cross-border coordination between governments. Even though this loose arrangement is common and mainly in transportation projects, it is clearly undesirable, as it ignores the challenges of a transnational infrastructure programme, and the programme-level benefits remain unrealized.

In the second level, each country has its own planning mechanism, but there is some kind of formal coordination between the countries as through an interministerial secretariat or a technical alignment forum. In this arrangement, the infrastructure asset is still not

consistently managed as a programme, but at least the coordination provides a way to address the challenges and reap some of the programme-level benefits.

In addition, it is fairly practicable and easier to implement than the third level. Finally, the planning is institutionally integrated in the third level in a dedicated programme unit. This arrangement allows for the proper managing of the endeavour as an infrastructure programme, for addressing all the challenges and securing all the programme-level benefits. However, it requires a very high political commitment from all sides, since it involves the partial

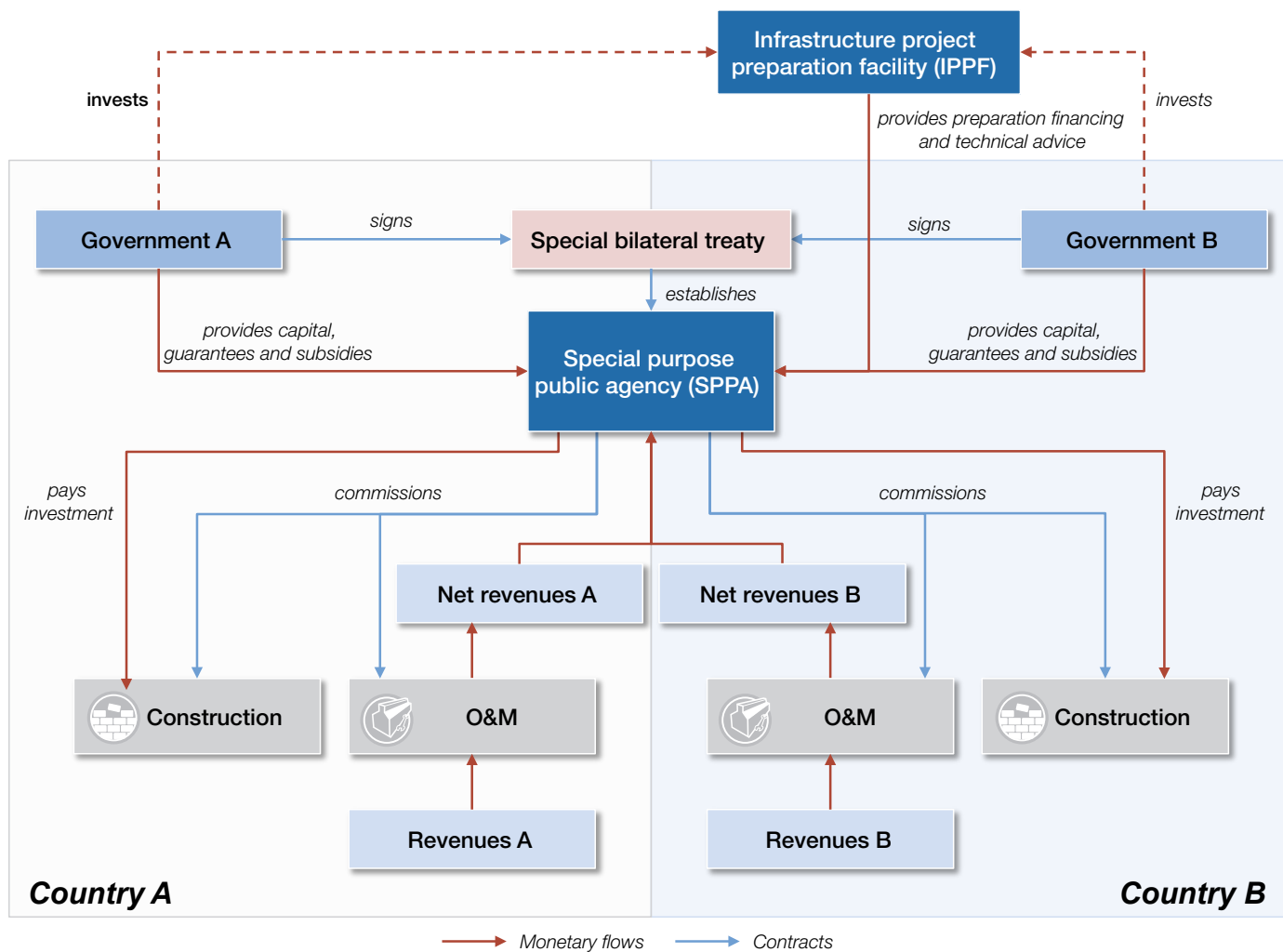
surrender of national sovereignty, as decision-making powers are transferred to the programme preparation and implementation unit.

To achieve the highest level of coordination or “institutionally integrated planning”, a separate unit with special rights should be set up to plan, implement and operate the programme, for example as a potential structure in a two-country setting (Figure 10).³² The two governments sign a special

bilateral treaty forming the legal basis for the establishment of a special purpose public agency (SPPA), which could become either a public consortium or a publicly-owned private corporation. In the case of a PPP, the corporation would be either jointly owned by the public sector of each participating

country and the private sector, or a purely private cooperation owned by a single company or a consortium. This SPPA would be governed by its statutes and by-laws, which need to be as detailed as possible to minimize potential disputes.

Figure 10: Proposed Governance Structure for Public Delivery of a Transnational Infrastructure Programme



Source: Adapted from Conthe, M. *Financial Structures for Transnational Infrastructure Projects in the IIRSA Context*, 2002

The main responsibility of this unit is to administer and manage the infrastructure, and arrange for the programme’s design, construction, O&M and financing.³³ The SPPA will act on behalf of the governments, and also award contracts for the infrastructure asset’s design, construction and O&M. While asset ownership will remain with the national governments in the case of a public delivery, the agency will supervise the preparation, construction and operation of the infrastructure facility (Box 2).³⁴ Capital received from the national governments will pay for the construction, and to cover O&M

costs of the infrastructure piece, all revenues should flow to the SPPA. If governments provide subsidies to make the programme financially viable, these should also be paid to the agency. Finally, if the SPPA raises financing itself on the capital market, for example through securitization of future revenues, the national governments might need to provide guarantees to the agency. Preparation of the transnational programme could be supported by an infrastructure project preparation facility (IPPF), which will provide financial resources and technical assistance, or might even be commissioned with the

whole preparation process and take over the viability risk.

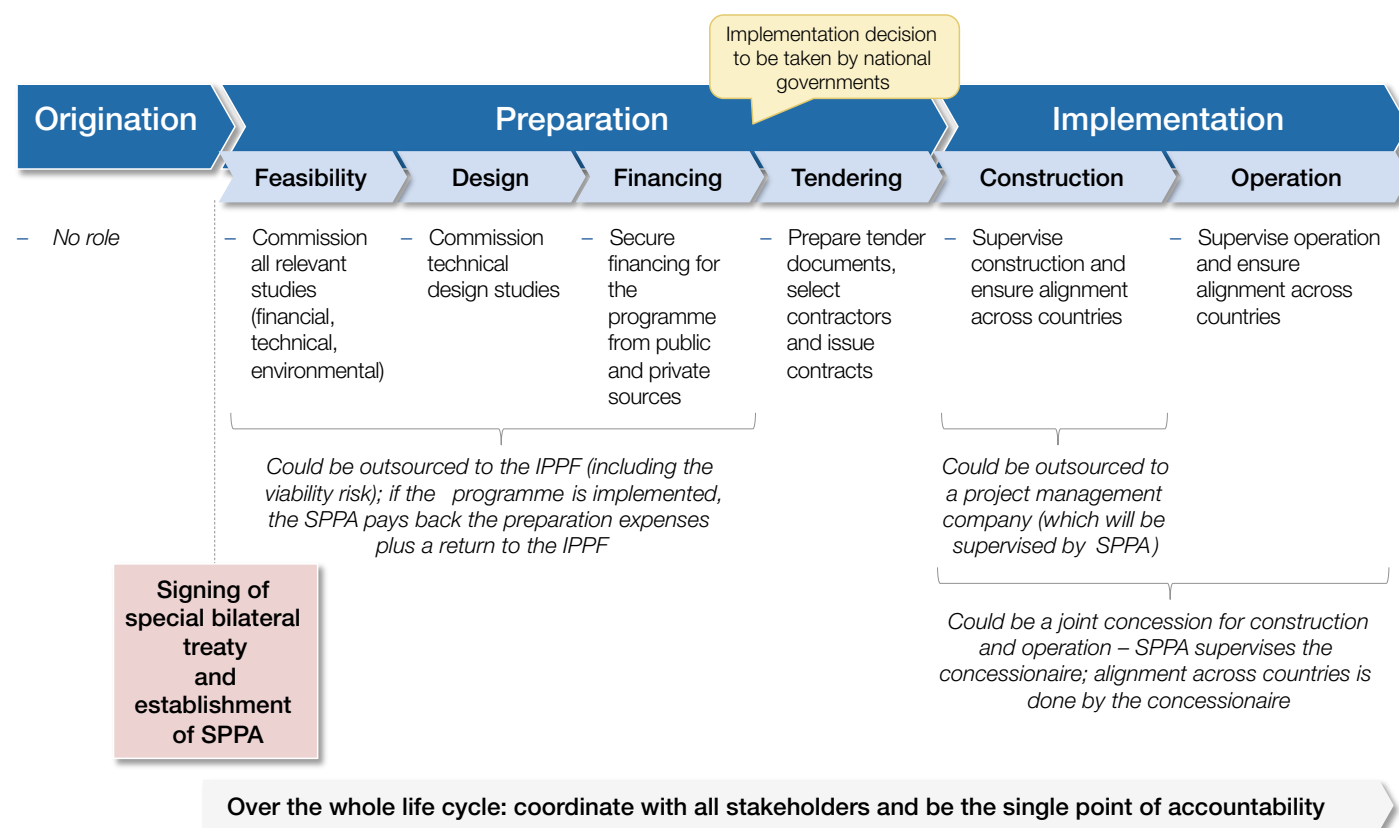
Box 2: The Role of the SPPA - from Preparation to Implementation

Figure 11 outlines the role of the SPPA over the infrastructure programme's life cycle. During the origination phase, the agency has no role since it is only established once the national governments decide to go ahead with a programme. In the preparation phase up to the financial close, the SPPA would commission all relevant studies and secure financing for construction and O&M. For these

tasks, it could receive financial and technical assistance from an IPPF. Alternatively, the whole preparation process could be outsourced to the IPPF. The decision on whether or not to implement a programme will be taken by the national governments. If they decide not to build the infrastructure, the SPPA will be dissolved. When it comes to tendering, the SPPA would prepare the documents, assess the bids

and award the contracts. The agency would be accountable for supervising the construction and ensuring alignment across all projects in the programme. A professional project management company could be commissioned with this task for complex programmes. Finally, the SPPA would be in charge of supervising the operation and making sure that maintenance requirements are aligned over the whole programme.

Figure 11: The Role of the SPPA over the Programme's Life Cycle



Source: World Economic Forum analysis

In addition to creating a strong programme implementation unit, the project sponsors (the respective ministries, e.g. transport, infrastructure, public works, energy, telecommunications; or, utilities) should pursue a number of more specific best practices under the category of institutionalized cross-border collaboration:

- *Arrange a fair representation of all participating countries in all governance bodies*
To balance national interests and to ensure commitment from all countries involved, positions should

be carefully allocated in governing bodies, such as the steering committee, general assembly and board of directors. In the structure shown in Figure 10, it would mean sharing out positions fairly in the SPPA. For example, the implementation authority of the Maputo Corridor created a dual-chair structure, with one chairperson each from Mozambique and South Africa. And, for its General Assembly, the power utility company Société Internationale d'Électricité des Pays des Grands Lacs (SINELAC) hosts the energy ministers of all three member countries, and

appoints two representatives from each country to its six-member Board of Directors.

- *Distribute corporate activities fairly across all participating countries*
Even if most of the operations occur in one country, it is still crucial to have a physical representation in all participating countries to avoid the perception that the project is dominated by one partner. In the proposed set-up (Figure 10), the SPPA would be physically established in the two countries, with some corporate functions in one country and others in the second. In

this light, two contrasting examples can be considered. In the first, an ill-fated case of a cross-border railway service, the operator based almost all its corporate activities in the country with most of the traffic, and limited its visible presence to just a small sales office in the other country. This under-representation duly led to allegations of favouritism, and a sense of disadvantage and resentment. The second example is the more successful approach taken by SINELAC, which has set up management and a power plant in the DRC, but the dispensing station and regional interconnection in Rwanda.

– *Build strong relationships with all key stakeholders*

According to a recent World Bank report, early engagement with stakeholders is essential, as their expectations often clash, and need reconciling if the project is to proceed smoothly. One key responsibility of a strong programme unit (the SPPA) is interacting with all stakeholders, as well as coordinating them. Different ministries and agencies often remain isolated in “silos”, and a skilled programme unit will work to draw them out and get them more actively engaged. Sometimes, however, such engagement is best managed by outside professionals. In one example, a cable network provider relied on independent experts and even political lobbyists to consult with and reconcile the various stakeholders. Another successful case is that of the Chirundu one-stop border post between Zambia and Zimbabwe. Broad-based stakeholder consultations were conducted very early on with representatives of the Common Market for Eastern and Southern Africa, the secretariats of the Southern African Development Community (SADC) and ordinary members of the Zambian and Zimbabwean public. In addition, the private sector was engaged at the outset to advise on the design of the project and to serve on various subcommittees.

– *Agree on a single language*

To minimize transaction costs in a multilingual setting, the participating countries should agree on a single working language for documents and correspondence. For instance, in the Maputo Corridor

implementation authority, only English was used. Although this single-language policy reduces the effort required and avoids process delays (notably, those due to necessary translations), it does not fully eliminate the risk of different interpretations, especially by non-native speakers. Moreover, it requires sensitive monitoring to ensure against any undue advantage for one party in negotiations.

– *Ensure high-level commitment from each government, and highlight the value of communication*

In a large infrastructure programme, several levels of governments are often involved. In order to avoid mismatches in prioritization and resource allocation, the highest political leadership must have and communicate a clear strategic vision for regional infrastructure.³⁶ Also, a clear political commitment should exist to pursue bi- and multilateral coordination. The Chirundu one-stop border post is an interesting case in point: its rapid implementation was helped by the strong support received from senior government officials in Zambia and Zimbabwe. Such backing is even more helpful when clearly communicated to all stakeholders. Mozambique and South Africa, for example, issued a prominent press release when their presidents agreed to support the one-stop border post on the Maputo Corridor. The programme managers as well should put great effort into communication. To maintain engagement and momentum, they should communicate conscientiously with their political contacts in each participating country by sending regular progress reports and requesting feedback.

– *Make early use of private-sector expertise*

The private sector’s specialized knowledge can be leveraged very early on, while the scope of the programme and the technical design are still being determined. Private-sector companies can provide valuable input on the latest technology and on cost-effective construction options. However, care must be taken not to rely exclusively on any one company’s services, or a conflict of interest could arise in the tendering phase.

Integrated Infrastructure Plans and Regional CBA

For successful preparation and implementation, the programme needs to be embedded into the national infrastructure plan of each participating country. Thus, the various plans need to be aligned and integrated, to ensure that the specific programme enjoys the same priority in all countries, and that sufficient financial resources are made available at the right time. In addition, the full benefits might depend on individual countries’ attending to supplementary infrastructure – assets that are not part of the transnational programme, such as feeder roads, or national grids in the case of cross-border transmission lines. The assessment of a programme’s economic viability should be taken at a regional level and involve all the affected countries, since the costs and benefits of a transnational infrastructure programme are often unevenly distributed, and a holistic picture provides the best basis for an accurate decision. At this stage, all national governments need to agree on the programme’s exact scope, and how to break the programme down into individual subprogrammes, projects and subprojects.³⁷

Specific best practices in this category are to:

– *Establish a regional sector planning framework with appropriate institutional arrangements*

Cross-border infrastructure programmes must be planned and implemented to align with the overall medium-term development strategy of each country involved; in addition to that, however, they should be studied within a regional planning framework.³⁸ The framework should not only utilize the existing tools for sector planning (such as least-cost planning), but also include strategic discussions at a high political level, as well as technical consultations at the working level. For example, within the GMS programme, a broad hierarchy of institutional arrangements was established to prepare subregional strategies, including ministry-level working groups for energy and transport, supported by several bodies for coordinating work at a technical level.³⁹



- *Establish a regional business case that includes all pecuniary costs and externalities*
When calculating the costs and benefits of an infrastructure facility, analysts should not confine their analyses to the individual countries, but should also look at the impact on the region as a whole, i.e. assess the regional effect of, for example, increased trade or a transnational rail or road network. Calculating only the pecuniary costs and benefits

is not enough; the externalities are critical as well (Box 3). Externalities are notoriously hard to quantify, and the assessment of monetary impacts of infrastructure projects tends to exaggerate the benefits and underestimate the costs. Analysts therefore need to be particularly cautious in their calculations.⁴⁰

- *Leverage regional development banks as a way of involving isolated regional areas*
The planning and implementation process of a transnational infrastructure programme often neglects outlying or isolated regional areas. If regional development banks apply pressure, however, the programme can be adapted to give these remote areas a greater role, as has been successfully accomplished in the Northern Corridor linking China to Thailand via Laos.⁴¹

Box 3: Costs, Externalities and Benefits of Transnational Programmes – A Numerical Example

The asymmetrical distribution of pecuniary costs, externalities and benefits of a cross-national infrastructure programme, and the importance of establishing a regional business case, can be illustrated by a simple numerical example (Table). Assuming a three-country setting, in which country A is landlocked, country B is a transit country and country C has a port: the plan is to build a railway line from country A through country B, to connect to the port in country C. Country A enjoys a benefit worth 500 units over time, derived in two ways: by exporting its mineral resources through the port, and by importing fertilizers

along the same route and thereby increasing its agricultural productivity. Constructing the railway track within country A incurs monetary costs of 100 units. Country B has monetary costs of 50 units for laying track, and has no benefits – unfortunately, the line runs through a sparsely populated nature reserve with a rich biodiversity and thus negatively affects the flora and fauna there; these externalities amount to an estimated 50 units for Country B. Country C has to build the largest share of the railway network within its boundaries, at a cost of 300 units; the associated economic benefits, however, are only 250 units.

To establish a regional business case, all the programme's pecuniary costs, externalities and benefits are considered. The total net benefit of 250 units makes the programme economically viable. However, countries B and C have a negative net benefit, and therefore, in a national assessment, have no incentive to build the railway line. As a result, country A will need to share its net benefit, and make a side payment to country B and country C of at least 100 units and 50 units, respectively.

Table: Distribution of Costs, Externalities and Benefits

<i>In Units</i>				
Impact	Country A	Country B	Country C	Total
Costs	(100)	(50)	(300)	(450)
Externalities	–	(50)	–	(50)
Benefits	500	–	250	750
Total	400	(100)	(50)	250

Source: World Economic Forum analysis

Aligned Delivery Model and Harmonized Concession Framework

Once a transnational infrastructure programme has been identified and its economic viability established through a regional business case, the participating countries should align on a delivery model and harmonize their concession frameworks. Both processes should be driven by the SPPA (Figure 10). A joint delivery model, such as a PPP or a public delivery in the form of a design-bid-build contract, will help to reap the programme-level benefits. For instance, single-model delivery of the whole programme will realize scale effects in procuring goods and services, and will greatly facilitate management and coordination of the preparation, implementation and operation of individual projects. If a concession is tendered for an infrastructure asset's construction and/or operation, the terms of the concession framework should be closely aligned across all involved jurisdictions. For a transportation programme, for example, all countries involved should agree on common standards, including the concession fee as a percentage of revenues, the minimum traffic volumes, the investment and maintenance requirements, and the contract's duration. This harmonized concession framework will once again help the management of the programme and make life easier for the concessionaire, which would otherwise have to comply with several differing sets of requirements. This, in turn, will lead to greater competition in the tendering process.

One specific best practice in this category has been identified:

- *Award a single concession*
If the infrastructure programme involves awarding a concession, ideally a single joint concession should be given rather than separate concessions in each of the involved countries. Once the single joint concessionaire has been decided, the task of managing the construction and/or operation is transferred from the SPPA to the concessionaire. The Maputo Corridor is a successful example: a single concession was tendered for the whole road, from Gauteng Province

in South Africa to the port of Maputo in Mozambique. In contrast, for a railway line in eastern Africa, two separate concessions were awarded, which differed in the concession fee, the transport haulage target and the investment prescription. This two-concession system has complicated and hindered the management of the railway line as a single piece of infrastructure. For instance, if rolling stock from one country is kept in the other for more than a few days, the owner country is entitled to reimbursement; revenues have to be carefully divided and allocated between the two countries, and each concession requires separate reporting.

Bankable Feasibility Study for Transnational Programmes

A bankable feasibility study is particularly relevant when participating governments choose to put a concession out to tender for the infrastructure programme. However, even if the choice is for purely public delivery, the programme sponsors should ensure that the technical, environmental and financial studies are conducted very diligently, and that they meet the same quality standards as those of a PPP or private delivery. This diligence is crucial because, currently, the studies do not automatically receive external validation from a private-sector company or consortium. A full feasibility study is just as important for transnational infrastructure programmes as for purely national ones: the sponsors must be able to make realistic forecasts of the demand for the asset, and to work out the most innovation-friendly, yet realistic and cost-efficient technical specifications. To assess the programme's commercial attractiveness, they need an accurate idea of its revenue potential – based not only on user charges and government subsidies, but also on sources such as ancillary business opportunities, earmarked taxes and land value capture. The sponsors should then conscientiously test this bankability through internal business case analysis and external market-sounding.⁴²

As mentioned earlier, demand forecasting is generally more cumbersome for cross-border

infrastructure assets. If the SPPA in the governance structure is commissioned to conduct the feasibility study, special care is needed to identify and put into place the right incentives. Generally, the SPPA's management has an incentive to get the programme implemented, so its objectivity is at risk, and an external validation becomes even more important.

Two specific best practices have been identified for this category:

- *Develop a broad and flexible off-take agreement*
An off-take agreement should of course be based on the predicted levels of consumption – but not exclusively so. The designers of the agreement should adopt a holistic view, taking account of, for example, risk sharing, capital investment requirements, maintenance obligations and interlinkages with other projects. In addition, they should specify key performance indicators, such as the ability to cope with peak demand. Finally, they should define criteria for adjusting and renegotiating the agreement. The concession agreement for the Maputo Corridor, for instance, contained a formula for adjusting tariffs on a yearly basis.⁴³ While all these features are advisable for any off-take agreement, they become particularly relevant for agreements in a bi- or multilateral setting, as no national government could adjudicate in disputed interpretations of the agreement or in cases of alleged non-compliance by one party.
- *Remove revenues from national government control*
Infrastructure projects are long-term endeavours that depend on public-sector support, either directly if subsidies are required, or indirectly if regulation influences a project's financial viability. At the same time, infrastructure facilities often generate revenues (e.g. through tolls or the sale of electricity), and national governments might be tempted to spend these revenues not simply on funding the projects' O&M or compensating stakeholders for the externalities, but for other purposes. In the case of a multinational infrastructure programme, several governments could be tempted to withdraw funds from it, even at other countries' expense. To reduce this risk, an integrated cash management

system should be set up. The SPPA should control all revenues generated by the transnational programme, wherever they derive from, and use them to cover all costs, wherever they occur.⁴⁴ This applies to revenues in any form – for example, tolls, ancillary revenues, and taxes on increased land value. The SPPA should also control the subsidies paid by the national governments, and even non-financial contributions such as guarantees. With regard to earmarked taxes, raised to finance transnational infrastructure in general rather than a specific programme, those funds should be controlled by a multicountry institution, such as the relevant REC, to prevent them from being used for other purposes.⁴⁵ In Europe, for instance, a proportion of revenues from common external tariffs is earmarked specifically for regional infrastructure or related purposes, and is put under the control of the European Union (EU).

Balanced Cost, Benefit and Risk Allocation, and Harmonized Regulation

As illustrated by the numerical example (Table, Box 3), the costs and benefits of a transnational infrastructure programme are frequently distributed unequally across participating countries. Indeed, some countries might have no benefits at all, but plenty of pecuniary costs and/or externalities. The danger in this uneven distribution is that it could prevent the implementation of an economically viable programme that has a clear, overall net benefit to society.

Hence, the crucial need for a carefully balanced allocation of costs, benefits and project risks. First, all externalities should, as a rule, be internalized by the programme; in other words, full compensation should be offered, expressed as an explicit monetary sum. Secondly, the individual governments should support the programme financially (e.g. through capital, subsidies, guarantees), in proportion to the benefits their countries receive from it.⁴⁶ As a cautionary note, countries might seek a “free ride” at times, by overstating the benefits other participants would receive and understating their own,

thus exaggerating their negative externalities.⁴⁷

Another crucial need is to harmonize regulations and standards. Unaligned or conflicting regulations and technical standards cause inefficiencies, and prevent the programme from realizing its full potential. Without aligned technical standards, the physical infrastructure might simply be unusable; at best, the cross-border interconnection will be very complicated. The harmonization of regulations, procedures, controls and laws, among others, will facilitate reaping the rewards of infrastructure assets. Of course, the harmonization should be in a positive direction: harmonizing serves no purpose if the shared feature is an inefficient model or practice.⁴⁸

For this category, three specific best practices have been identified:

- *Find and commission a strong, impartial and respected arbiter to apportion costs and benefits*
Since countries have an incentive to overstate their costs and understate their benefits, the allocation should be overseen by a strong and impartial arbiter. This arbiter will conduct and/or apply a standard CBA.⁴⁹ Involving the host countries in the assessment is essential, as without their support, collecting information could be very expensive and time-consuming.⁵⁰ In addition, involving civil society organizations is helpful; they can play a very useful screening and monitoring role, ensuring that transparent processes are in place, and can give a voice to stakeholders adversely affected by the programme.⁵¹ Once the organization serving as arbiter has determined the fairest allocation, it should develop a detailed compensation plan based on the allocation scheme, stating which party in which country receives which type of compensation, and at what time. Such a plan should also take into account all transnational externalities, including the spread of HIV/AIDS, the erosion of social values and cultural identities, and human trafficking.⁵² In the GMS programme, the Asian Development Bank assumed the role of arbiter or honest broker, and supported Laos as a transit country in the negotiations over pricing policy, to ensure that the newly created infrastructure assets would not impose an undue fiscal burden on the country. The bank also worked actively to ensure costs and benefits were fairly distributed across the countries – a particularly

important task, since most of the immediate benefits would accrue to China and Thailand.⁵³ Other potential candidates for the role of a neutral arbiter are the RECs or the AUC. In the governance structure already outlined, the SPPA, as a non-political instrument, should be in charge of financially compensating the stakeholders in all affected countries, in accordance with the predefined plan.⁵⁴

- *Harmonize and radically simplify technical standards, regulations and specifications, taking advantage of international models*
To maximize the efficient use of the infrastructure asset and to minimize disruptions at the border, technical standards, regulations and specifications need to be harmonized across countries. The choice of specific standards will depend on the type of project. Broadly, three degrees of cross-border harmonization exist (Box 4). One of the challenges cited very often by those in the research was that of differences in national procurement regulations. Such incompatibility can lead to conflicts and process delays. An effective and face-saving solution is to put aside all national standards, and base the agreement instead on internationally accepted procurement standards, such as those set by the World Bank or the EU. This approach succeeded in overcoming the procurement challenge for one-stop border posts in the ECOWAS region.
- *Regulate the programme through special treaties or a regional agency*
To harmonize the technical standards, regulations and procedures, all participating countries could enter a special bi- or multilateral treaty regulating the programme. (This approach would be at the second level – “programme-specific regulations” – in the classification discussed in Box 4.) Such a treaty would not only drive the regulatory alignment, but also reduce the risk of unilateral changes by one jurisdiction, and thereby increase stability.⁵⁵ Alternatively, a regional agency could be created to regulate a specific programme or even, more efficiently, a whole sector.⁵⁶ For example, the Pacific Aviation Safety Office was established to reduce overall supervision costs and meet international standards – by avoiding duplication, creating economies of scale and harmonizing regulatory systems.⁵⁷

Box 4: Three Levels of Harmonization

When participating countries have differing standards and regulations, these differences have to be resolved, at least far enough for the project to proceed. Resolution could be pursued on three different levels, which vary in their effectiveness and complexity.

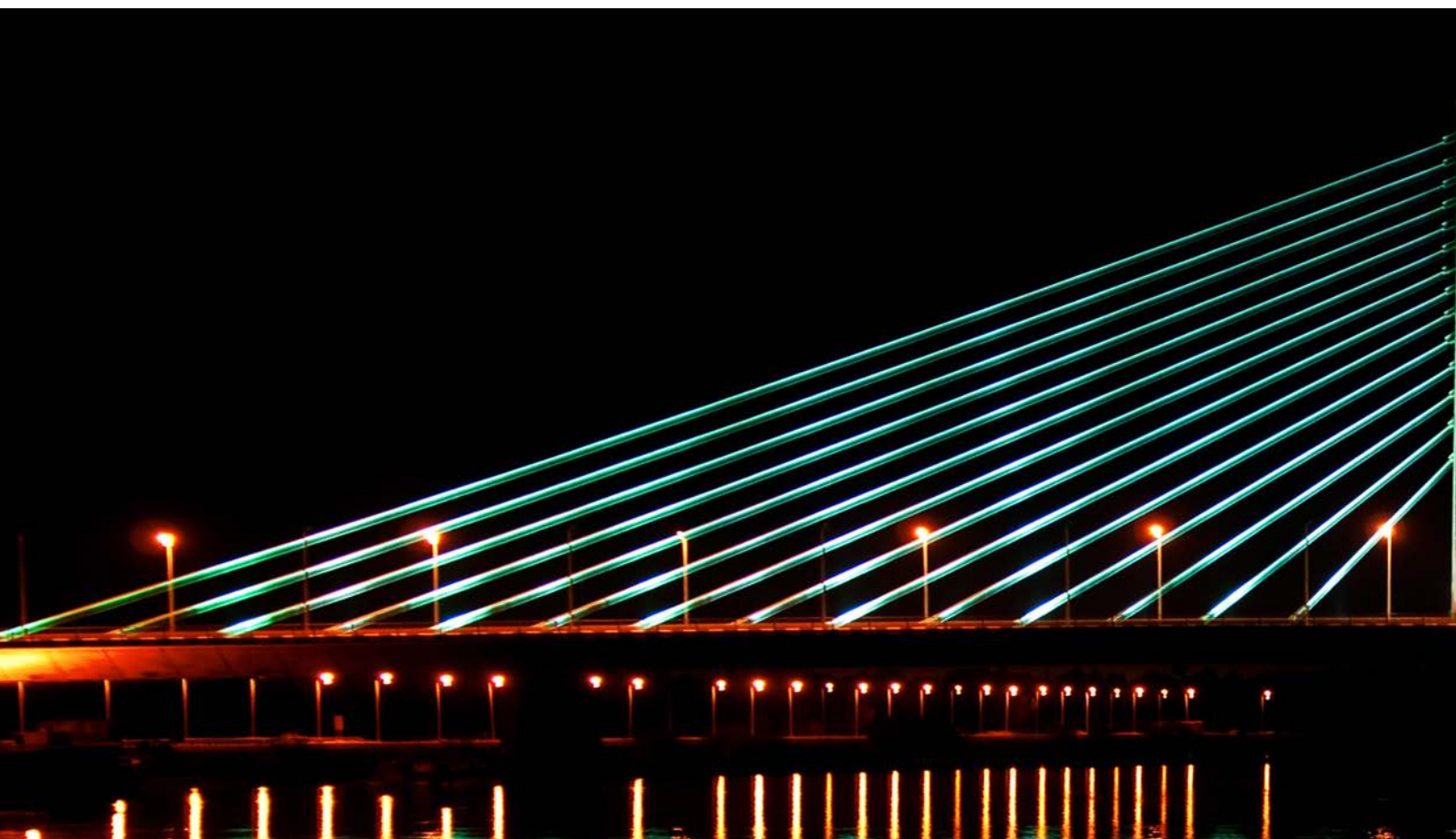
Cross-national standardization is the highest-level, most effective yet also most complex form of resolving regulatory differences. It involves the agreement to and adoption of bilateral or regional regulations that are widely applicable, rather than restricted to just one project. What makes this standardization so difficult are the issues of national sovereignty raised. A country, for instance, might resent having to abandon a long-standing norm on maximum axle load, meaning compromises might have to be made. Successful examples of cross-national standardization include uniform protection systems and transmission standards in the Southern African Power Pool and WAPP, and the joint standards for one-stop border posts in the SADC. Since this approach might involve adapting existing regulations, and might not be specific to a particular

programme, the process should be driven by national governments or regional entities such as the RECs. Private companies can also take this approach; Transnet, for example, urged the defining of regional rail standards (e.g. safety, signalling) through bilateral agreements with a number of countries, including Zambia and Mozambique. The same method is now adopted for ports. However, cross-national standardization is probably impracticable if it requires major changes to existing infrastructure assets. Standardizing a region's rail gauge, for example, might mean upgrading all existing railway lines in one of the countries, which would not be cost-effective.

In such cases, the second, lower level of harmonization might be more appropriate: agreement on *programme-specific regulations*. In this type, countries negotiate a set of agreed standards that would apply exclusively to the project in question. For instance, two countries might agree on specific procedures for a one-stop border post. Alternatively, the countries could agree to entrust certain decisions to the organization in charge of preparing, implementing and operating the infrastructure programme. They would endow that organization with special rights to draw up regulations

and procedures that differ from those applied elsewhere in the countries. (Of course, programme-specific regulations might turn out to be a first step towards cross-national standardization, as the agreed standards might subsequently be incorporated into revised and harmonized national policies.) An example of this approach is the Maputo Corridor, where Mozambique had a lower maximum axle load than South Africa. Since the road was constructed for the higher standard, trucks on this road were allowed to have a higher axle load than on other roads in Mozambique. Since this approach is programme-specific, it should be driven by the project implementation unit in collaboration with the governments of the involved countries.

Finally, at the lowest level, the most straightforward and least complex type of harmonization is *regulatory alignment*. A simple review of existing regulations and processes will identify the overlaps and contradictions, and suggest procedural adjustments. National regulations remain untouched, but the new procedures help with the transition from one system to another, and simplify the border-crossing process. For technical standards, the transition can usually be accomplished through existing solutions: transforming the



voltage in cross-border electric power transmission; using a variable gauge system at the border to switch from standard to narrow gauge; or defining interfaces for IT systems to enable the flow of information. Aligning processes usually takes little effort – the adoption of joint forms at a one-stop border post, for instance – and saves much red tape. Since the national regulations of individual countries are not affected in this approach, the process could be driven independently by the implementing organization.

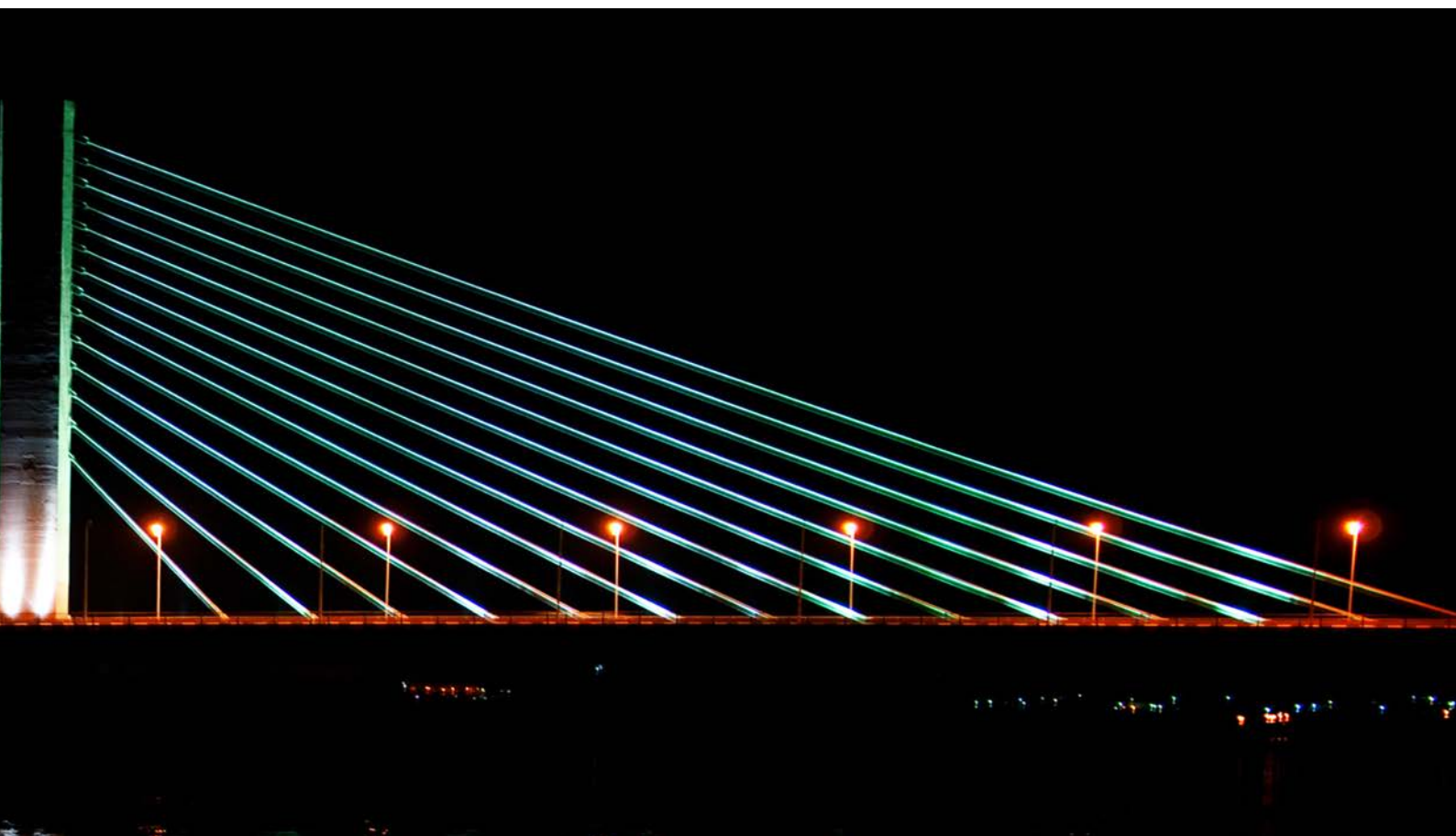
Notably, different harmonization approaches might be most appropriate for different aspects of a single programme. Two existing railway networks with different gauge widths, for example, are upgraded and connected, and a one-stop border post is erected. Since the tracks already exist, it might not be efficient to bring them to the same technical standard. A technical solution is thus required to bring trains from one gauge width to the other (regulatory alignment). The one-stop-border post, in contrast, could be governed by newly introduced regulations and procedures, which become valid for all one-stop border posts in the region (cross-national standardization).

Competitive, Transparent Tendering and Optimal Financing Structure

With the sensitive topic of procurement, national interests are particularly prevalent, and the assignment of large construction contracts or operating concessions is prone to opacity and corruption. To reduce those dangers, and to ensure a competitive and transparent tendering, the programme sponsors need to create the right governance structures and processes. Equally important, they need to establish an optimal financing structure for transnational infrastructure programmes. As explained earlier, financing such programmes is very difficult – particularly in the African context, owing to low development and usage levels, limited financial capabilities and significant heterogeneity of neighbouring countries' economies and cultures.

Five specific best practices have been identified for tendering and financing:

- *Set up a procurement committee that includes neutral experts*
The ECOWAS region serves as a worthy model in its efforts to balance national interests and increase transparency. For the procurement of one-stop border posts, a procurement committee was set up, with members drawn from all beneficiary states plus one observer from the EU.
- *Establish regional financing instruments*
Regional connectivity is a public good with large or substantive positive externalities. Accordingly, multilateral and regional institutions should play a prominent role in the financing of transnational infrastructure programmes. For example, the EU established the first mechanisms for supporting cross-border infrastructure programmes in 1994.⁵⁸ Today, it helps to finance intraregional connectivity and regional competitiveness, using “structural funds” at below-market rates, while the European Investment Bank has a substantial role as well in financing these programmes.⁵⁹





- *Leverage risk-mitigating guarantees*
While the careful allocation of risk to all relevant parties is essential, it is equally important to reduce risk by applying adequate instruments. As discussed earlier, foreign investors and lenders often perceive the political risk of transnational programmes as being higher than that of purely national programmes. Therefore, multilateral institutions should provide credit enhancements and guarantees, such as the insurance offered by the World Bank Group’s Multilateral Investment Guarantee Agency (MIGA).

- *Reduce exchange rate risks by reflecting revenue currencies proportionally in the financing structure*
When a transnational infrastructure programme involves different currencies, one of the key challenges is to optimize the financing structure. Specifically, if revenues are not generated in the same currency as that for the financing, the risk of exchange rate issues arises.⁶⁰ In theory, this risk can be easily eliminated if the financing structure uses the same currency proportions as the expected revenues.⁶¹ Referring to the numerical example (Table, Box 3), and assuming that all benefits can be monetized as revenues, the project’s total monetary costs and externalities are 500 units; and, the total revenues are 750 units, of which 500 are

generated in country A and 250 in country C.⁶² Since two-thirds of the revenues are generated in country A’s currency, so, too, should two-thirds of the financing be provided in this currency, with the remaining one-third in country C’s currency. As already mentioned, however, this structure remains a purely theoretical one for many African countries, as local currency financing is simply not available.⁶³

- *Make use of purchasing-power parity protection to insure against exchange rate risks*
Alternatively, exchange rate risks can be mitigated by an insurance scheme or “exchange rate guarantees” provided by public authorities in the countries involved.⁶⁴ However, such insurance or guarantees can be prohibitively expensive in the case of very volatile African currencies. A potential solution was developed by the US Government’s Overseas Private Investment Corporation (OPIC) to cover the exchange rate risks of a \$300 million bond issued by a Brazilian company to finance a hydroelectric power plant.⁶⁵ In this approach, the guarantee or insurance covers only that part of the local currency against the loan currency, which is not offset by inflation differentials. This technique is based on the notion that purchasing power parity holds in the long term, so that fluctuations

in the nominal exchange rate only mirror differences in inflation rates. Historical data show that real exchange rates are far less volatile than nominal exchange rates, meaning this type of protection against devaluation is cheaper than traditional instruments.⁶⁶ To be totally effective, this instrument requires tariffs that are fully inflation-linked so that the local purchasing power remains stable.

Alignment of the Construction Process and O&M Requirements

The benefits that arise from managing a transnational infrastructure programme as a programme, rather than as individual projects, occur not only in the origination and preparation phase, but also during construction and operation of the facility or asset. Regarding construction, for example, the dovetailing of processes will ensure that the different stretches of a railway track can be interconnected at the border as scheduled, or that a cross-border transmission line is available on schedule so that a new hydroelectric power plant does not remain unused. As for maintenance requirements, they should ideally be aligned for the whole infrastructure programme. This



is particularly the case if production is located in one country and consumption in another, as in transnational energy or water programmes, given that maintenance issues might jeopardize the supply abroad. In the governance structure already outlined, the SPPA would be in charge of aligning the infrastructure facility's construction and O&M.

Two specific best practices have been identified in this category:

- *Set up an expert committee to supervise construction*
To support the SPPA in overseeing the construction process, a committee should be established with experts from all participating countries: they could include representatives of multilateral institutions as well as governments, and would support the screening and supervision of contractors to reduce the chance of delays to the entire programme.⁶⁷ The committee would also help to maintain good working relations with the relevant public-sector stakeholders in all the countries involved and throughout the operation of the infrastructure asset.
- *In the off-take agreement, specify management protocols for aligning demand and maintenance requirements*
Maintenance is a particularly delicate topic if consumption and

production are not located in the same country, as necessary repair works will affect the supply of water, oil or electricity abroad. The off-take agreement should therefore specify management protocols for bringing maintenance requirements in line with demand. These protocols will help to align supply and demand over time, to cope with peak demand periods and to ensure that maintenance on the production side does not impact adversely on consumption. It would be the SPPA's responsibility to implement these management protocols.

Conducive Enabling Environment

So far, all the best practices listed have applied to specific infrastructure programmes. However, a more general need also exists – for an enabling political and regulatory environment, one that will help in originating, fostering and realizing any number of transnational infrastructure programmes.

For this category, three specific best practices have been identified:

- *Establish a single integrated framework for planning and designing transnational programmes*
To minimize transaction costs, reduce the risk of failure and avoid

lengthy processes, a formalized institutional or legal framework is far preferable to a system of managing programmes ad hoc and one-by-one.⁶⁸

- *Build up dedicated capacities and capabilities*
The smooth preparation, implementation and operation of megainfrastructure projects and programmes – national or transnational – demand a broad set of legal, financial, technical and project management skills, among others. These capabilities are needed in the public sector (e.g. ministries, public agencies, RECs), in national and regional finance institutions (e.g. development banks), in parastatals (e.g. national utility or railway companies) and in the programme management unit (e.g. the SPPA). The governments involved should build up the required capacities and capabilities at an individual and institutional level, particularly through dedicated training programmes.
- *Invest in building relationships based on trust*
Trust between the relevant parties is essential for a fruitful relationship. While institutions, treaties and agreements can support bi- and multilateral cooperation, they are no substitutes for trust. Governments need to make political efforts to develop mutual trust and understanding – by fostering dialogue and interactions among politicians, experts, the news media and citizens.⁶⁹ Moreover, trust is crucial at both the political and working level, given the possibility of dealing with cross-national teams or foreign clients. A one-stop border post will involve new procedures and relationships for border officials, while a new transnational transmission line will necessitate unfamiliar dealings with foreign customers. When such changes are introduced, staff should be educated on the advantages, or at least the purpose, of the new system; otherwise, some staff will remain uncommitted, or might even become disruptive. In addition, other imaginative interventions should be considered to ease the transition. When cross-border staff begin working together for the first time, organizing social activities, for example, can help foster mutual understanding and build trust.



Conclusion

Despite the political vision of an integrated economy in Africa, transnational infrastructure is still lagging behind its ambitions on the continent. African leaders established the PIDA initiative to provide the physical backbone of regional integration: the idea was to define multicountry infrastructure programmes in the transportation, energy, water and ICT sectors, and to assign them the highest priority for implementation. However, these programmes face formidable inherent challenges, and their realization has been hampered accordingly. The challenges and issues vary in intensity, according to the type of programme, the phase and the conditions prevailing in the participating countries. The consensus is that cross-border infrastructure projects are even more demanding than purely

national megaprojects. The best practice framework described herein provides guidance on how to manage transnational infrastructure programmes over their entire life cycles – from integrating national infrastructure plans and balancing the allocation of costs and benefits, to aligning the construction and O&M processes. The value of a conducive enabling environment for such programmes is clear, as is the need to institutionalize cross-border collaboration throughout a programme's lifespan. The specific best practices identified for each part of the framework should help programme sponsors and managers put the framework into practice. Just as the challenges vary from programme to programme, so too does the relevance of the best practices. In other words, there is no simple

roadmap for successful implementation. This concept paper is descriptive, not prescriptive, in its motivation: it distils the lessons learned from previous programmes in Africa and around the world, rather than presuming to give instructions on implementing future programmes. Still, if it helps infrastructure policy-makers, programme sponsors and managers to get their bearings, it will enable the delivery of cross-national programmes on schedule, at cost and of high quality. That, in turn, will encourage a proliferation of regional infrastructure programmes and the benefits they bring – including improved public health through better water and electricity supplies, a boost in local prosperity and greater regional integration.





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Endnotes

¹ “Transnational infrastructure” refers to any type of hard or soft infrastructure that involves more than one country. See Section 2 for a detailed definition and classification. In this concept paper, the terms “transnational”, “cross-national” and “cross-border” are used interchangeably.

² International Transport Forum (1997).

³ European Union (2008).

⁴ Fung et al. (2011).

⁵ Beato (2008). At least two other explanations exist for the underprovision of transnational infrastructure. First, regarding transport assets: given the complexities of binational or multinational transport networks, and the uncertainties of investment, the dominant game theory strategy for both or all governments, as Cárcamo-Díaz and Goddard (2008) show, is to refrain from investing in the project even in a dynamic game setting. Second, regarding energy transmission projects: as Navajas (2008) argues, cross-border contracts are bound to be incomplete, given the many unforeseeable contingencies. Accordingly, investors tend to shy away from such projects.

⁶ Project Management Institute (2008).

⁷ The role of a programme manager is to integrate, monitor and control the interdependencies among the components to achieve the programme benefit. Specific tasks include: coordinating supplies; resolving resource constraints that affect multiple projects; mitigating risk activities that affect several components of the programmes, such as contingency planning; resolving issues of scope, costs, schedule or quality; and tailoring interfaces and processes (Project Management Institute, 2008).

⁸ For illustrative purposes, this is a very simplified version of the actual Central Corridor programme.

⁹ Fung et al. (2011). In contrast, “hard” refers to physical infrastructure components; for example, transmission lines in the power sector, paved roads and railway tracks in the transport sector, pipes and aqueducts in the water sector, and subsea telecommunication cables in the ICT sector.

¹⁰ This relationship is described by the so-called gravity model of trade (Tinbergen, 1962).

¹¹ While the gravity model (see endnote 10) implies that the demand for transnational trade is higher between two large countries, the necessity of connecting them is higher for smaller countries.

¹² Numerous other reasons for the low level of intra-African trade exist, such as the small size of the markets, low production capacities, limited trade and investment opportunities, weak human and institutional capacities, political instability and insufficient trade facilitation. Other factors curtailing potential trade include the lack of complementarity, lack of diversification of production structures, high production costs, inadequacy of other forms of infrastructure (e.g. ICT), shortcomings in soft infrastructure (e.g. import quotas, anti-dumping regulations, countervailing duties, border tax adjustments, subsidies and technical barriers such as sanitary measures and rules of origin) and excessive red tape (Barka, 2012).

¹³ The high number for transnational planning/policy coordination is driven by continent-wide regulatory alignment programmes, such as the Single African Sky programme to create a high-level, satellite-based air navigation system for the African continent, and the Smart Corridor Programme to develop a model smart corridor technology and to design and implement a system for monitoring the efficiency of continental and regional corridors. The number for cross-border physical infrastructure is largely due to those with a transnational split of production and consumption, as when electricity is produced in one country and transported to consumption centres in other countries through cross-country transmission lines.

¹⁴ Rilo et al. (2012).

¹⁵ Beato (2008).

¹⁶ Conthe (2002).

¹⁷ Conthe (2002).

¹⁸ CIA (2014).

¹⁹ Conthe (2002).

²⁰ Barka (2012).

²¹ Conthe (2002).

²² World Economic Forum (2013a).

²³ Jaafari (1984).

²⁴ CIA (2014).

²⁵ Commission of the European Communities (2003).

²⁶ In any case, the basis for proportioning is problematic. Proportional to what, exactly – to the countries’ investment levels, their likely consumption levels or their populations?

²⁷ Commission of the European Communities (2003).

²⁸ Conthe (2002).

²⁹ Jaafari (1984).

³⁰ While both organizations publish a comprehensive database with project reviews, most of the projects are not transnational, but are implemented in only one country. Among those that involve more than one country, very few exist that are type 2 or 3. Instead, most transnational projects in the database concern policy alignment or the joint management of resources. Even in these project reports, most of the challenges and lessons learned deal with national rather than transnational problems.

³¹ Fung et al. (2011).

³² The structure shown is a slightly adapted version of the one presented in Conthe (2002). To simplify the illustration, only two countries are shown, but the structure could easily accommodate more than two countries.

³³ A good example of such an entity is the CLSG Regional Transmission Company, created to manage the power interconnection project for Côte d’Ivoire, Liberia, Sierra Leone and Guinea. Another example is the implementation authority for the Maputo Corridor, which had a clear political mandate from both South Africa and Mozambique, and was commissioned and duly authorized to sign the concession contract.

³⁴ The term “programme life cycle” is used since the SPPA is managing a programme of different projects (see Figure 1).

³⁵ World Bank (2013).

³⁶ Fung et al. (2011).

³⁷ Such a consistent definition is frequently missing in the case of PIDA, and hampers its implementation.

³⁸ Fung et al. (2011).

³⁹ Fung et al. (2011).

⁴⁰ Flyvbjerg et al. (2010) review the empirical evidence (from projects in developed countries), and warn that the regional trade effects of transport infrastructure are often heavily overestimated.

⁴¹ Fung et al. (2011).

⁴² World Economic Forum (2013b).

⁴³ This concession agreement contained another interesting clause to mitigate the risk for the concessionaire (who bore the full commercial risk, as no traffic volume was guaranteed): if one of the countries failed to raise the tariffs as agreed, both countries could be held jointly and separately liable for the concessionaire's sustained loss.

⁴⁴ Conthe (2002).

⁴⁵ Tanzi (2005).

⁴⁶ Conthe (2002). In the example cited in the Table, country A will need to provide all the financial resources for the programme, since it is the only country with a positive net benefit.

⁴⁷ Conthe (2002).

⁴⁸ Tanzi (2005).

⁴⁹ Unfortunately, even a standard model assessment of costs, benefits and evaluation of externalities is unlikely to produce an objective and undisputed solution. It is thus particularly important that the arbiter should be neutral, well respected and trusted by all participating governments. To reduce the complexity of the decision process, Conthe (2002) suggests the arbiter should offer the participating countries a limited choice of options for burden-sharing; in a two-country setting, for example, the options of offer might be [0:1], [1/3:2/3], [1/2:1/2], [2/3:1/3] and [1:0]. Unless exceptional circumstances arise, such as a natural disaster affecting the infrastructure asset asymmetrically in different countries, the allocation defined at the beginning should be upheld throughout the programme's life cycle.

⁵⁰ Beato (2008).

⁵¹ Fung et al. (2011).

⁵² Fung et al. (2011).

⁵³ Fung et al. (2001). The outcome of the process was that China and Thailand shared two-thirds of the investment and provided concessional financing to Laos.

⁵⁴ Conthe (2002).

⁵⁵ Conthe (2002).

⁵⁶ If setting standards for a specific programme, the agency would usually set "programme-specific regulations". However, if the agency is able to overrule national regulations, and if the new standards are also applied to existing infrastructure assets in the sector, the work would amount to "cross-national standardization".

⁵⁷ Fung et al. (2011).

⁵⁸ Turró (1999).

⁵⁹ Fung et al. (2011).

⁶⁰ This is true of intranational infrastructure projects as well, if local currency financing is not available.

⁶¹ Conthe (2002).

⁶² This calculation assumes that the externalities are fully internalized and that compensation is paid to the affected society in country B. It also assumes that all costs (including externalities) need financing.

⁶³ If long-term financing has to be raised in US dollars, exchange rate risks could be eliminated by indexing tariffs to the exchange rate (Conthe 2002). However, such an approach is often not politically feasible, and would put enormous pressure on users if the local currency were to experience severe devaluation.

⁶⁴ Conthe (2002).

⁶⁵ Presented in Conthe (2002).

⁶⁶ The purchasing power parity holds in the long term, since short-term fluctuations in the real exchange rate will tend to cancel each other out. Hence, the longer the maturity of the foreign exchange borrowing to be hedged, the safer the coverage. Such protection will also improve the loan's credit rating and will therefore lower financing costs.

⁶⁷ Conthe (2002).

⁶⁸ Fung et al. (2011).

⁶⁹ Fung et al. (2011).

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List of Abbreviations

AfDB	African Development Bank
AUC	African Union Commission
CBA	Cost-benefit analysis
CLSG	Côte d'Ivoire, Liberia, Sierra Leone, Guinea
DRC	Democratic Republic of Congo
EC	European Commission
ECOWAS	Economic Community of West African States
EU	European Union
GMS	Greater Mekong Subregion
ICT	Information and communications technology
IT	Information technology
IPPF	Infrastructure project preparation facility
MIGA	Multilateral Investment Guarantee Agency
NEPAD	New Partnership for Africa's Development
O&M	Operation and maintenance
OPIC	Overseas Private Investment Corporation
PIDA	Programme for Infrastructure Development in Africa
PIDA PAP	Programme for Infrastructure Development in Africa – Priority Action Plan
PPP	Public-private partnership
REC	Regional Economic Community
SADC	Southern African Development Community
SINELAC	Société Internationale d'Électricité des Pays des Grands Lacs
SPPA	Special purpose public agency
UN	United Nations



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