Delivering Cross-Border Infrastructure: Conceptual Framework and Illustrative Case Studies

October 10, 2024

Asian Infrastructure Investment Bank

European Bank for Reconstruction and Development

Inter-American Development Bank

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory or area.

Acknowledgements

This draft study has been prepared for the G20 Infrastructure Working Group (IWG). It has been developed jointly by the Asian Infrastructure Investment Bank (AIIB), the European Bank for Reconstruction and Development (EBRD) and the Inter-American development Bank (IDB). Several other multilateral development banks (MDBs) and G20 member countries have contributed case studies, including the European Investment Bank (EIB), the African Development Bank (AfDB), and the Governments of Brazil, China and South Africa. The principal authors include Erik Berglof, Zhe Fu, Yue Li, Aleksandr Prodan and Murtaza Syed (from AIIB); Hiroyuki Ito and Matthew Jordan-Tank (from EBRD); and Pablo Pereira dos Santos and Jesus Alberto Tejeda Ricardez (from IDB). The authors are grateful for the guidance received from the G20 presidency and the IWG Co-Chairs. Special thanks also go to all the G20 member countries, other MDBs, international organizations and participants at the G20 meetings for their valuable comments.

Table of Contents

Executive Summary

Cross-border infrastructure projects connect two or more countries, facilitating the flow of goods, services, people, ideas and technology. They provide significant long-term economic and social benefits. Roads, bridges, railways, and transmission lines promote trade and travel, create opportunities, increase living standards, and improve competitiveness. They can also help to advance climate and nature conservation objectives. Overall, the economic case for cross-border infrastructure rests in addressing coordination failures between countries in providing infrastructure services and in providing regional public goods that enable access, mobility and integration.

However, delivering cross-border infrastructure is much more complicated than normal infrastructure. The major barriers stem from the need for coordination, diverse incentives of different stakeholders, asymmetry in costs and benefits between the countries involved, differences in state capacity, divergences in legal and regulatory frameworks, regulatory uncertainty, and complexities in coordinating funding sources for countries with different levels of financial market development and ability to borrow from the international market.

This study takes an in-depth look at these barriers and proposes a conceptual framework to anticipate them and make the most of cross-border infrastructure projects. It uses this framework to analyze selected case studies drawn from energy, transport, financial, digital, water and nature projects. Based on this analysis, the study provides recommendations for how to best deliver a cross-border infrastructure project.

The conceptual framework provides an analytical frame to analyze the complexities of cross-border infrastructure projects. The framework is based on three dimensions, which have been used to inform key lessons and considerations for policymakers based on the case studies presented in this study, with some additional specific recommendations for energy, transport and nature projects also discussed in the study. These recommendations are broad in nature and application should be balanced in the context of each country. The specific circumstances of countries will affect how each recommendation is adapted and applied, and how it aligns with the G20 Compendium of Quality Infrastructure Indicators:

1. Economic Rationale and Planning

- A successful cross-border project needs to be rooted in a **compelling economic rationale** for the countries and region involved, and **sound planning** requires an assessment of aggregate **economic and social returns** as well as their **distributional effects**. Beyond delivering aggregate economic benefits and positive social returns, a successful cross-border infrastructure project requires the buy-in of all countries involved and the support of all stakeholders. Countries often have asymmetric endowment structures. The costs and benefits tend to be **distributed unevenly across countries and among stakeholders**. In this context, **distributional analysis** is essential to inform project planning on the complementarity or competition between countries. For more complex projects, distributional analysis can leverage **cutting-edge economic tools** to improve the spatial granularity and quality of existing cost-benefit analysis, such as spatial computable general equilibrium models and models to predict behaviors in energy markets.

- On the planning front, **alignment of the project with national development goals** of all the countries involved is critical, such as those related to, among others, growth, poverty reduction, connectivity, trade and supply chains. To generate such alignment, a **high-level cross-border infrastructure commission** empowered with resources and decision-making authority is a useful device. In order to maximize economic and social benefits, it is important for the planning process to include thorough **consultations with all stakeholders**, including the private sector and civil society.

2. Political Support and Governance

- The inception of a cross-border project requires **high-level political will and support**. On the governance side, success hinges on **policy alignment and cross-border institutional arrangements** that can bridge differences in laws and regulations, and act as a coordinating mechanism.

- To mitigate heightened political risks, an **inter-government agreement** can help by aligning policy, planning and legal frameworks between countries. Such agreements can take various forms, have varying degrees of binding powers, and can evolve over time. They can range from simple **MOUs** to a **bilateral (or multilateral) treaty** embodying a more formal legal framework that defines roles and actions of the countries involved and establishes implementation and monitoring mechanisms.

- **Inter-governmental institutional arrangements** are also needed to **coordinate** implementation and decision-making, as well as to mitigate the asymmetry in government capacity. Cross-border projects necessitate **strong governance capacity** as reflected in policy certainty and predictability, good management of contracts and sound monitoring and enforcement ability. Again, the form of these arrangements varies and often evolves over time. The more **formalized** the coordination mechanism, the greater the **enforcement** capacity. This can be especially important for more **complex** projects.

3. Finance and Management

- The financial structure of a cross-border project is vital to its viability and success. While the exact structure is **project-specific**, it should aim to respect the respective **national policy parameters**, provide **value for money**, reduce **risk**, competitively determine **financing requirements**, and avoid **contingent liabilities**.

- The risks that such projects face are unique, spanning from geopolitical to counterparty to demand and currency risks. Therefore, public funds, together with support from multilateral development banks, are often needed to **crowd-in the private sector** and make **projects bankable**. Government support can take many forms, including the direct participation of state companies, the setting up of dedicated public project companies, and project financing. Countries with high public debt or poor credit ratings can find it difficult to provide such support.

- In addition to providing some part of the financing, the **private sector** can also play a major role in the **design, construction, operation and maintenance** phases of cross-border projects.

Separately, **multilateral development banks** (MDBs), including regional ones, can support the delivery of cross-border projects across all of the above three dimensions by acting as a **catalyst, convener, mediator, risk mitigator** and **financier**. They can curate and share **cutting-edge knowledge** on impact assessment and distributional analysis. They often undertake the **technical, legal and environmental/social impact studies** required to attract international financing. MDBs are also best positioned to **convene and mediate on inter-government project agreements** and **institutional setup**. In addition, they can provide **technical assistance** on **regulatory harmonization** and **institutional building**. Finally, the bankability of cross-border projects can also be enhanced through **multilateral financial support** in the form of concessional loans, contingent support, guarantees or other credit enhancement instruments.

1. Introduction

Throughout history, cross-border projects have played a critical role in the economic development of societies, shaping wider regional—and indeed global—trade and wealth creation. Iconic historic examples include the Great Silk Road, the Panama and Suez Canals of the early 20th century, the Pan-American Highway, and the continental railroads of North America.

Today, cross-border infrastructure remains at the center of debates on prosperity, poverty reduction, and economic growth. Roads, bridges, rail networks, communication networks, and transmission lines connecting border regions can promote trade and travel, create market opportunities, improve economic competitiveness, and influence the way people live, move, and work. They can also have an important effect on the efficiency of public services in these regions, especially those aimed at reducing poverty and providing better living standards.

Cross-border infrastructure is closely linked to trade in goods and services, mobility of people, and exchange of ideas. Countries with good border infrastructure are better connected to regional and global value chains and are more efficient in promoting regional cooperation and economic integration initiatives with neighboring countries. For land-locked countries, this type of connectivity is critical to economic development and overall prosperity.

Cross-border infrastructure also influences the living costs and the general productivity of economies. Energy supply, internet connections, and structures for the flow of goods and services across all modes of transport affect production costs and ultimately impact the income and living standards of citizens. In other words, countries are more prosperous and more efficient if they have structures that allow for connection and interaction with economic agents living in other countries.

Cross-border infrastructure, like other infrastructure, also impacts on climate and nature. Gray infrastructure can be profoundly harmful, with lock-in effects spanning long horizons.[1] By ensuring their design and implementation are within the context of Paris alignment, consistent with global nature conservation objectives, and in line with sustainable infrastructure principles, building cross-border infrastructure is also an important opportunity to advance climate objectives and achieve Sustainable Development Goals.

In fact, climate is global, and nature has no distinct borders. In Latin America, while nearly 60 percent of the Amazon rainforest is in Brazil, the rest is shared among Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela, French Guiana, and an overseas territory of France. In Asia, several important water systems travel through multiple countries: the Indus basin, for example, is shared by Afghanistan, China, India and Pakistan, the Ganges-Brahmaputra River system is shared by Bangladesh, Bhutan, China, India and Nepal and the Mekong flows through China, Myanmar, Laos, Thailand, Cambodia and Viet Nam. Nature is important infrastructure. In this context, cross-border sustainable infrastructure emerges as another opportunity to improve global climate and environmental resilience as well as to support sustainable and equitable growth.

Building cross-border infrastructure is a complex endeavor that entails unique challenges. High-level political support of investments from all countries concerned is decisive since one country`s investment depends on the investment decisions of others. Incentives to create common infrastructure are asymmetric. Incentives to create a cross-border infrastructure are asymmetric.

[1] See, among others, World Bank 2007 and UNOPS 2021.

As a result, things could be more difficult if building a common infrastructure requires the same level of effort across countries. However, a thorough early assessment study laying out the benefits and costs of various countries involved could help increase the motivation and political ownership of countries to address this incentive compatibility issue. Coordination challenges may affect not only initial political decisions but the whole life cycle of infrastructure projects, from early planning, project preparation, risk analysis, and design, to construction and maintenance. A critical analysis of benefits—financial, economic, and social—from such projects is crucial to ensure their sustainability over the longer term.

Building common infrastructure also necessitates policy coordination and special institutional arrangements. Norms and standards for the flow of goods and services, which require negotiation between the authorities of neighboring countries, including subnational entities, have a significant impact on the ability to implement successful cross-border infrastructure. In all cases for a successful project of this nature, these negotiations must occur before construction is initiated to avoid the risk of obsolete or inadequate infrastructure. Furthermore, certain 'enabling' institutions need to be in place to maintain coordination across sovereignties as well as to position each participating country to derive full benefits of such cross-border projects.

Finally, the financing of common infrastructure brings another layer of complexity. Countries financing the largest sections of projects might not gain the most from them. Shared infrastructure can sometimes be financed through joint financing mechanisms, but coordination, in these cases, is also challenging since countries must negotiate together and agree to the financial conditions related to the lifecycle of the infrastructure projects. The appropriate financing structure for such projects must also be determined and may well involve differing degrees of public, private and multilateral development bank (MDB) involvement, with the requisite need for significant dialogue between governments to determine the optimal and acceptable mix.

The purpose of this study is to present best practices for carrying out and financing cross-border infrastructure projects, while managing additional challenges associated with such projects. These practices are developed by reviewing the literature and studying a selection of case studies across a wide range of countries and encompassing energy, transport, digital, water and nature sectors. Section 2 of the study discusses a conceptual framework to deliver cross-border infrastructure projects. Based on the framework, Section 3 discusses lessons from the case studies, and Section 4 distills some actionable policy recommendations. Section 5 concludes with an in-depth review of the nine case studies, based on the conceptual framework. These cases are:

- Central American Interconnection System – SIEPAC *(energy project)*
- Monsoon 600-Megawatt Cross-border Wind Power Project *(energy project)*
- Paraguay-Paraná Waterway *(transport project)*
- Middle Corridor (MC) *(transport project)*
- Karawanke Tunnel (8km) between Austria and Slovenia *(transport project)*
- Rail Joint Border Crossing Station at the North Macedonian-Serbian border *(transport project)*

- Integral Sanitation Program for the Cities of the Uruguay River Basin – Entre Ríos Province *(water/nature project)*
- China-Lao PDR: Mohan to Vientiane Railway *(transport project)*
- Capricorn Bioceanic Corridor *(transport project)*
- Lesotho Highlands Water Project Phases 1 and 2 *(water/energy project)*
- African Exchanges Linkage Project *(digital/financial project)*

2. Conceptual Framework

2.1 Definition of Cross-Border Infrastructure

Cross-border infrastructure can include different sets of projects in different contexts. As such, a variety of definitions are used in the literature.[2] This study adopts a functional definition of cross-border infrastructure as *projects that have both a physical footprint and development impacts that traverse the territory of two or more countries. They require coordination between the corresponding countries across many levels, depending on the complexity of the project* (Fujimura and Adhikari 2010; Global Infrastructure Hub 2021).

The case for cross-border infrastructure traditionally lies in addressing coordination failures between countries in delivering the needed infrastructure services and in providing regional public goods, which enable factor mobility, market integration and service access. Increasingly, with the emergence of renewable energy and natural infrastructure projects, cross-border infrastructure also provides opportunities to advance climate goals, increase resilience, and deliver global public goods. Following the broadened view about infrastructure, the sectors covered in this study include energy, transport, water and nature projects.

The additional challenges and risks faced by such infrastructure arise from their cross-border and multi-country nature. These include asymmetric distribution of costs and benefits; different policy, legal, and regulatory frameworks across sovereignties; different state capacities in project planning, implementation and operation across countries; and multiple stakeholders that could be evolving due to the growing scope of a project or unforeseen factors such as the incidence of natural disasters. Last but not least, the concerned countries often have different levels of domestic financial market development and ability to borrow from the international market, which make these projects more prone to market or government failures. At the extreme, countries with fiscal risks and poor credit ratings may find it impossible to engage in mutually beneficial cross-

[2] For example, the European Bank for Reconstruction and Development (EBRD) includes projects supporting "integrated" transition quality, which encompasses expansion of physical transport projects that address bottlenecks and materially improve the mobility of goods and people between or within regions, as well as between countries. In other words, the physical footprint of the projects can be within one country. As another example, the European Investment Bank (EIB) defines cross-border infrastructure projects as investments with fixed assets that physically link two or more countries via infrastructure (EBRD 2020; EIB 2023).

The Inter-American Development Bank defines four criteria to identify in general integration operations as follows: (i) **cross-country focus** – projects that contribute directly or indirectly to a greater regional or global insertion of Latin American and Caribbean (LAC) countries and/or to promote regional collective action and cooperation; (ii) **regional additionality** – projects that generate additional value added through the incorporation of objectives of internationalization and/or regional cooperation; (iii) **national subsidiarity** – projects that contribute to the alignment of domestic policy reforms and of national/sub-national investments with cross-border objectives; and (iv) **compensation of coordination failures** – projects that generate incentives that compensate market failures (cross-border externalities), coordination failures (costs of collective action) and other costs related with the complex execution of regional collective initiatives.

border projects (Fujimura and Adhikari 2010; Global Infrastructure Hub 2018, 2021; Puga 2008; UNESCAP 2021).

2.2 A Conceptual Framework for Delivering Cross-Border Infrastructure

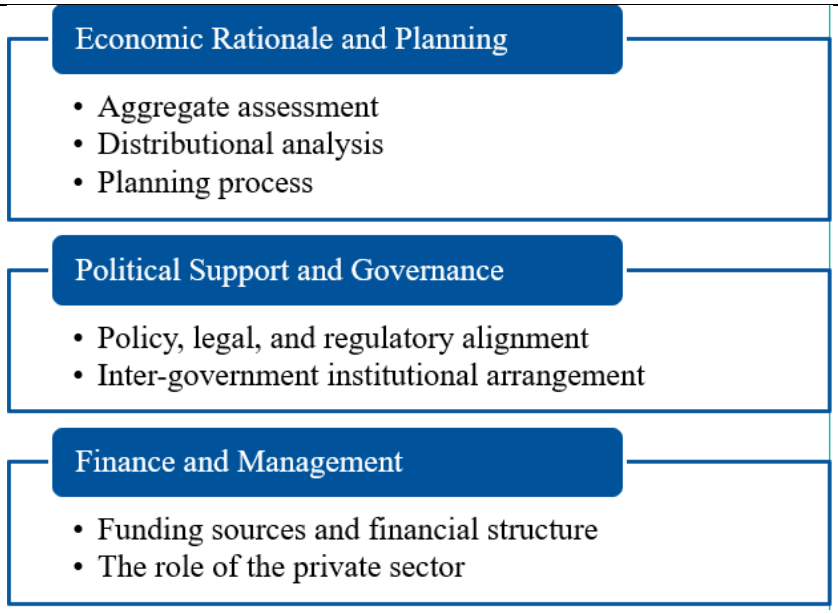
Delivering cross-border infrastructure requires both understanding benefits and managing downside risks. The details of best practices are contextual, varying by infrastructure types. Nonetheless, they share some common themes. This report proposes to use a conceptual framework with three broad dimensions as a lens to analyze these diverse and complex projects. The three areas follow the life cycle of a project, namely *economic rationale and planning*, *political support and governance*, and *finance and management (Figure 1):*

- First and foremost, a successful cross-border project needs to be rooted in a compelling *economic rationale*. A strong economic rationale helps to develop a common vision for all countries and parties involved and informs project planning. Sound project *planning* starts with the assessment of aggregate economic and social returns. More importantly, for cross-border projects, planning also requires evaluating the distributional effects of projects and design measures to ensure incentive compatibility.

- The initiation of a cross-border project often relies on political champions and its success inevitably depends on the *political support* and will of governments from planning to implementation and from finance to management, which can be particularly challenging if governments change. Regarding *governance*, the success of a cross-border infrastructure project generally demands policy alignment and/or inter-government institutional arrangements, building on high-level political support. Such a project often faces the challenge of different country-level policy and planning frameworks. Differences in laws, regulations and standards create further complications or reduce benefits during the operation of the project. It is important to reconcile these “soft” issues as early as possible. Inter-government institutional arrangements often become necessary, especially for a complex project and in the context of significant state capacity gaps. Conflict prevention and resolution is also an important consideration. However, policies and institutions need not be rigid. Capacity building and adaptation can take place along the project life cycle.

- On *finance and management*, the financial structure of a cross-border project is central to its viability and success. The unique risks—including size, duration, geopolitical, counterparty, fiscal, demand, and currency—make them more expensive and complicated to fund. They are also more prone to market or government failures since they require the financial structure to be acceptable to all countries and financial stakeholders. The optimal financial structure should aim to respect the respective national policy parameters, provide value for money, reduce risk, competitively determine financing requirements, and avoid unknown contingent liabilities. Public finance is more often used compared to private finance in such projects, given risks that are typically too large to make the projects bankable. However, with some public support in the form of grants, subsidies, concessional loans or guarantees, such projects can mobilize private capital.

Figure 1. A Conceptual Framework for Delivering Cross-Border Infrastructure



Source: Authors.

Finally, multilateral development banks (MDBs), including regional ones, can act as a catalyst, convener, mediator, risk mitigator and financier, supporting the delivery of viable cross-border projects across all three areas. MDBs can curate and share cutting-edge knowledge on project preparation, project management, impact assessment and distributional analysis. They often undertake the technical, legal and environmental/social impact studies required to attract international financing. MDBs are also best positioned to convene and mediate on inter-government project agreements and institutional setup, given that the countries benefitting from the investment are members of the same institution. Taking a step further, they can provide technical assistance on regulatory harmonization and institutional building. Multilateral financial support in the form of concessional loans, contingent support or guarantees or other credit enhancement instruments, can also enhance the bankability of cross-border projects.

The following section discusses in detail specific considerations for each of the three dimensions of the conceptual framework, drawing on lessons learned from the cases studies of cross-border projects selected for this report. The role that MDBs can play is also highlighted.

3. Lessons from Selected Cross-Border Infrastructure Projects

3.1 Economic Rationale and Planning

Aggregate assessment

In a modern project context, cross-border infrastructure development requires a sound planning context to help prioritize and identify new projects. Underpinning all the selected cross-border projects is a strong and enduring economic rationale that informs the planning process and

supports not only the initial investment, but also the long-term operations, maintenance and asset renewal needs[3].

Cross-border projects most often address coordination failures and provide much needed regional public goods. Regional energy markets are among the most salient cases, including the *Central American Electrical Interconnection System (*SIEPAC*)*. The project extends across six countries, with a capital value of US$505 million and physical assets covering a transmission system, a fiber optic cable, and 15 substations. SIEPAC was estimated to reduce the long-term average incremental cost of generation in the region by US$17/MWh based on the first cost-benefit analysis (CBA) in 1997 and the reduction was re-estimated to be 9.5 US$17/MWh between 2011 and 2025 based on the updated cost-benefit analysis in 2011 (see Box 1 on CBA methodologies). An ex-post analysis confirmed the economic rationale, determining the benefits to be about US$156.2 million between 2013 and 2015.

Cross-border connectivity infrastructure involving transport and digital projects have been among the most popular with policy makers. However, not all corridors have transformative impact. Successful projects rest on careful assessment and identification. Several of the selected examples are part of large well-studied and carefully appraised regional networks. For example, both *the Karawanke Tun*nel project between Austria and Slovenia, and the *Rail Joint Border Crossing Station* project at the North Macedonian-Serbian Border are segments of the Trans-European Transport Network (TEN-T), with a particular importance for the promotion of regional trade, economic growth, and connections to and within the European Union. The benefits of projects can also evolve over time, as illustrated in the case of the *Middle Corridor* (covering Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan). In terms of digital projects, designing and building a harmonized link trading infrastructure can be important. For example, the African Exchanges Linkage Project (AELP) aims to enable and facilitate cross-border trading and settlement of securities across participating African stock exchanges. The goal is to boost Pan-African investment flows, promote innovations that support diversification needs of investors in Africa, and help address the lack of depth and liquidity in Africa's capital markets.

Cross-border infrastructure plays an increasingly important role in global public goods provision. Renewable energy projects as part of regional trade markets help to advance global climate mitigation goals. For instance, SIEPAC has taken advantage of large hydroelectric project surpluses in Costa Rica and Honduras and allowed successful exchanges with their neighbors. The cost-benefit analysis of the project estimated about 25.7 million tons of CO2 emissions avoidance. As another example, the *Monsoon Cross-border Wind Power* project is not only the first wind power project in Lao PDR but also the largest wind farm in Southeast Asia and the first cross-border wind power project in Asia.

Cross-border conservation projects are receiving more appreciation regarding their protection of biodiversity, nature, water, and the associated ecosystem services. For example, the Amazon hydrographic region is the greatest repository of biodiversity in the world, home to around 10% of all the world's known species of plants and animals. The Amazon Basin also plays a critical role in global water and biogeochemical cycles. Its rivers hold one-fifth of all the freshwater of the planet; the average annual drainage volume of the basin exceeds 6.5 km^3, which represents over 70 percent of the freshwater discharge in Latin America and approximately 20 percent of the planet's freshwater discharge. Countries in the region are working together to preserve this

[3] A strong economic rationale and planning aligns cross-border projects with QII Principles 1 and 2.

precious cross-border infrastructure. As another case in point, the *Integral Sanitation Program for the Cities of the Uruguay River Basin – Entre Ríos Province* is an illustration of parallel ongoing efforts by countries in the South American hydrographic region to preserve the Uruguay River Basin, another invaluable cross-border infrastructure. The Uruguay River is an international waterway, with its basin encompassing territories of Argentina, Brazil, and Uruguay, covering a total area of approximately 339,000 km². The project will improve water quality and bolster basin-wide efforts for transboundary water management.

Box 1. Cost-benefit analysis and wider economic benefits

As a systematic approach, the cost-benefit analysis (CBA) helps estimate the scale and distribution of investment return to the society versus the costs incurred. CBA also helps assess whether the benefits to users and other stakeholders are likely to exceed the costs.[4] For cross-border projects, a special focus is to identify and value the additional benefits arising from regional cooperation, including the facilitation of technology transfer alongside the increased foreign direct investment, efficiency gains from regional specialization based on selling in a larger market, and so on.[5]

In this context, other model tools can be used to complement CBA and provide estimates regarding the wider economic benefits. Studies such as Allen and Arkolakis (2014), Donaldson and Hornbeck (2016), Ramondo, Rodríguez-Clare and Saboroío-Rodriíguez (2016), Redding (2016), and Bartelme (2015) have shown how the trade and production factors (e.g., labor) can be mobilized with the development of infrastructure. For example, the benefits of time savings from the cross-border infrastructure may significantly boost the cross-border labor market, reduce the income wedge for the same type of labor across regions, and help build a more functional region.

Distributional analysis

Beyond delivering aggregate economic benefits and positive social returns, a successful cross-border infrastructure project requires the buy-in of all countries involved and the support of all stakeholders. Countries often have asymmetric endowment structures. The costs and benefits tend to be distributed unevenly across countries and among stakeholders. In this context, distributional analysis is essential to inform project planning on the complementarity or competition between countries—for example the complementarity in energy supply and demand, the complementarity in transport/logistic services between transit and landlocked countries, and the competition in the use of water resources between upstream and downstream regions. Such analysis will also reveal the distribution of costs, benefits, and impact between countries (e.g. displacement effects and agglomeration effects along a transportation corridor) and among different stakeholders within a country.

[4] Global Infrastructure Hub (2021).
[5] ADB (2017)

In some projects, the benefits and costs are split relatively evenly between countries. In the *Karawanke Tunnel* project, Austria and Slovenia are to share the toll collected and to both benefit from the improved user safety and increased connectivity. Therefore, they are responsible for the cost of the project on their responsible territories, which are comparable, and hence, both are subject to potential localized negative environmental impact. In some other cases, the countries that benefit the most from the project also bear proportionately more of the construction and maintenance cost and other negative externalities. For example, in the *Integral Sanitation Program for the Cities of the Uruguay River Basin* project, Argentina covers the project cost because its citizens residing in the cities along the Uruguay River coast are the main beneficiaries.

However, many projects can entail a more complex distribution of benefits and costs. As mentioned above, SIEPAC is estimated to have delivered an economic benefit of US$156.2 million between 2013 and 2015. 70% of the benefit is estimated to accrue to Guatemala (the main electricity exporter), 11% to Costa Rica, 9% to Panama, and 10% to the other three countries. The six countries contributed equality to the initial equity financing of the project. In the case of the *Monsoon Cross-border Wind Power* project, both the Lao PDR and Viet Nam will benefit from the project. It leverages Lao PDR's rich resources for wind power generation and will also reduce Lao PDR's current dependence on hydropower and diversify its source of electricity exports. It helps meet Viet Nam's rising energy demand while supporting the country's Nationally Determined Contribution (NDC) under the Paris Agreement. Regarding cost, Lao PDR bears much of the construction and maintenance cost and will be subject to potential localized negative environmental and social impact as most physical infrastructure falls in its territory. For the *Middle Corridor* project, the cost of developing the Central Asian segments is estimated to be EUR 18.5 billion. The benefits are projected to differ between implementing countries as it is difficult to define fair value sharing arrangements.

Some benefits and costs of cross-border infrastructure projects are more closely related to social and environmental aspects. Specifically, the *Monsoon Cross-border Wind Power* project will have a positive impact on the local community in Lao PDR through community development programs such as supply of medical equipment and the renovation of school facilities. The project company also plans to enhance gender equality in the work environment. Besides the project costs, the construction and operation of the project bring negative environmental and social impacts on Lao PDR, including a moderate impact on landscape values, reduction in habitat for supporting key globally and/or nationally threatened species, economic displacement of local households who are also key stakeholders, and impacts on livelihoods.[6] The *Integral Sanitation Program for the Cities of the Uruguay River Basin* project is another example which helps to address the historical binational concern of the river's contamination caused by untreated wastewater discharges from the towns within the Uruguay River Basin. As a result, the positive environmental impact of this project could be considered a major beneficial component of the project assessment.

For more complex projects, distributional analysis can leverage cutting-edge economic tools to improve the spatial granularity and quality of existing cost-benefit analysis. Spatial computable general equilibrium models have gained growing popularity among economists and practitioners to support assessment of transport infrastructure and other place-based interventions. For example, Fajgelbaum and Schaal (2020) develops a model to study optimal transport networks

[6] See 55205-001: Monsoon Wind Power Project (adb.org) and Monsoon Wind Power Project: Final Stakeholder Engagement Plan (adb.org).

in a spatial general equilibrium setting and applies the model to assess optimal investments and inefficiencies in the road networks of European countries.[7] In particular, the study compares the optimal network estimated by the model and the TEN-T, the European Commission policy mentioned above. It reveals that the two planning networks overlap in many priority investment areas but differs in some locations, suggesting possible need for further refinement of the TEN-T, and highlights the importance of international coordination in infrastructure planning and investment (Box 2).

As another case in point, energy economists have developed several models to predict behaviors in energy markets, including computable general equilibrium models with an electricity component, multi-regional linear programming models and so on. Siddiqui et al. (2020) uses a multi-model approach, applying six models, and assesses how changes in cross-border energy infrastructure in North America (Canada, US, and Mexico) will impact local and national markets.[8] It finds that when electricity production from renewable energy is expected to increase, the changes in cross-border energy infrastructure do not significantly impact the generation from renewable energy. Overall, the study helps identify specific bottlenecks in the cross-border energy infrastructure and proposes future investment opportunities to decrease overall system costs for producing and consuming energy.

Planning process

The initial planning process is particularly important, with successful projects typified by an alignment of the project with national economic development goals for all participating countries; with high-level political leadership organized within the context of a 'cross-border infrastructure commission' empowered with decision-making responsibilities; with dedicated and coordinated project-based resources from each participating country reporting to the cross-border commission.

For example, five Central Asian countries involved in the Middle Corridor are currently exploring ways to ensure regulatory harmonization and operational facilitation across borders to operate infrastructure efficiently and to increase competitiveness, as well as to facilitate coordination in planning, prioritization and implementation.

The planning process should also ideally include thorough consultations with the private sector and civil society and adjust project scope to maximize economic and social benefits. Over the long-term, both the economic success of such projects and the continuing political support will depend on a broad range of stakeholders perceiving benefits.

MDBs and international organizations often play an important role in convening all participating countries, helping to initiate the political / institutional supporting bodies for the cross-border endeavor; and undertaking the full technical, legal and environmental/social impact studies required to attract international (including MDB) financing, and ensure alignment of timelines and adherence to high-quality standards.

---

[7] Fajgelbaum, Pablo, and Edouard Schaal. "Optimal transport networks in spatial equilibrium." *Econometrica* 88, no.4 (2020): 1411-1452.

[8] Siddiqui, Sauleh, Kathleen Vaillancourt, Olivier Bahn, Nadejda Victor, Christopher Nichols, Charalampos Avraam, and Maxwell Brown. "Integrated North American energy markets under different futures of cross-border energy infrastructure." *Energy Policy* 144 (2020): 111658.

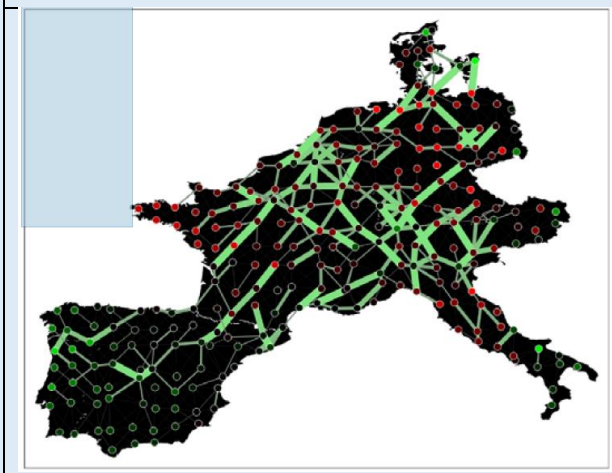
Box 2. The optimal transport network for Europe by a spatial model and the TEN-T

Spatial computable general equilibrium modelling has gained increasing popularity among economists and practitioners. These models build on both general equilibrium models of international trade and the tradition of economic geography. They rely on microeconomic foundations and structural approaches but are rich enough to accommodate concrete spatial features and interactions. They support assessment of transport infrastructure and other place-based interventions by undertaking counterfactuals and provide predictions on spatial distribution of economic agents and activities.

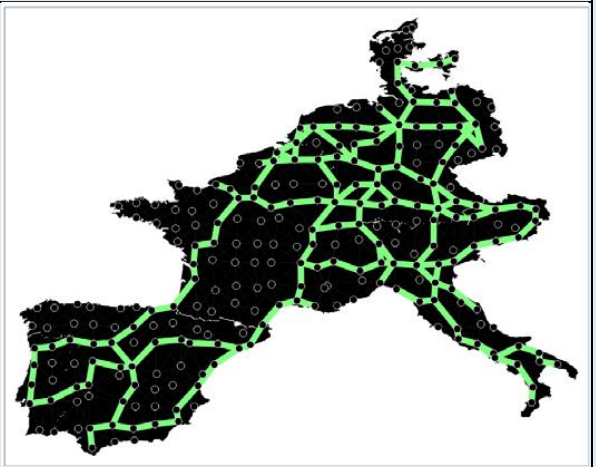
Fajgelbaum and Schaal (2020) applies a spatial computable general equilibrium modelling approach to study optimal transport networks. It develops a model consisting of a neoclassical trade model with labor mobility in which locations are arranged on a graph. The optimal transport network is the solution to a social planner's problem of building infrastructure in each link. The study applies the model to assess optimal investments and inefficiencies in the road networks of European countries and the optimal placement of roads as a function of observable regional characteristics.

It implements the analysis for a region of western Europe and ask whether the estimated optimal network is approximately comparable with the Trans-European Transport Network (TEN-T), a European Commission policy that supports the development of Europe-wide transport networks. In the figure below, Panel (a) shows the optimal network estimated by the model and Panel (b) shows these corridors of TEN-T for the area of Europe covered by the estimation. Broadly speaking, the optimal network identifies many priorities for investment which appear to be similar to what TEN-T has identified, such as the high density of investment in Benelux countries and Germany; the international corridor from Paris to the southwest of France, north of Spain, and Portugal; and the connection between Germany and Denmark. However, there are also some differences, as the optimal network does not identify the need to invest in roads connecting the southeast of France to the south of Spain and Portugal.

a. Estimated Optimal Network



b. Discretized TEN-T Network



Source: Authors based on Fajgelbaum and Schaal (2020).

For example, the Rail Joint Border Crossing Station project at the North Macedonian-Serbian border includes development of the Environment and Social Action Plan to ensure the project will be structured in accordance with the Performance Requirements set by EBRD's Environmental and Social Policy to ensure adherence of high-quality standards in both countries and will be used to monitor Project compliance.

These types of projects also have long-lead times. The work on the EU TEN-T networks is a decades-long process, whereby 'projects of common interest' are eligible for accelerated permitting and regulatory treatment. In Central Asia, the Central Asia Region Economic Cooperation (CAREC) corridors are another good example of a long-term initiative supported over the long-term by MDBs, such as ADB, AIIB, EBRD, EIB, and World Bank.

3.2 Political Support and Governance

Policy, legal, and regulatory alignment

Cross-border infrastructure is more likely to be successful when there is sustained high-level political support. Given the inherent complexities of such projects, often requiring years (even decades) to fully prepare, construct and complete, political support must be sustained in each country. Relative to national projects, political risks to cross-border infrastructure are more acute due to the involvement of multiple countries. First, cross-border projects are subject to the general political risks faced by all infrastructure projects include election cycles, leadership transitions, socio-economic challenges, contract enforcement difficulties, default risks, and government interference. In addition, cross-border projects can be stalled by political tension and rivalries between countries, differences in political agendas between countries, and general socio-economic differences between countries. Therefore, it is vital that these projects have strong and public political support in all the countries involved so they can better transcend political shifts and shocks.

To mitigate the amplified political risks, an inter-government agreement based on a clear economic rationale can help[9]. Such agreements can align policy, planning and legal frameworks between countries. These agreements can also solidify a shared commitment towards bilateral (or multilateral) cooperation at the project level. The inter-government agreements of successful projects have different forms with varying degrees of binding powers. There is no one-size-fits-all solution, and the agreements can evolve over time (Figure 2).

The agreement can start with a bilateral (or multilateral) memorandum of understanding (MOU) between countries, supported by subsequent concrete project-level agreements. An MOU can communicate the common objectives of countries involved and set a common line of action toward implementing the investment. For example, for the *Monsoon Cross-border Wind Power* project, the Government of Viet Nam and the Government of Lao PDR signed an MOU for the supply of 5GW of renewable power from Lao PDR to Viet Nam in 2016. The project was then officially nominated by the Lao PDR to the Ministry of Industry and Trades of Viet Nam under a collaboration in the energy sector between the two countries in 2017. Finally, the Government of Lao PDR and the Viet Nam Electricity Group, the state-owned power monopoly of Viet Nam, signed a 25-year Power purchase Agreement.

[9] A solid governance framework facilitates public and private investment decisions by reducing political and regulatory uncertainty in line with QII Principle 6.

The public agreement can be initially embedded in a broader regional agreement and then be realized at the project level. The broader agreement potentially provides more political assurance and binding power. For example, a comprehensive treaty was signed between South Africa and Lesotho to govern the Lesotho Highlands Water Project Phases 1 and 2. This treaty evolved over time, with protocols added to address specific issues such as royalty calculations, cost apportionment, project governance and dispute resolution mechanisms. Relating to the Rail Joint Border Crossing Station project, there was the Western Balkan 6 Initiative (WB6 or the *Berlin Process*) established in 2014 which spelled out a four-year reform framework aiming to support the parties in the Western Balkan in strengthening regional cooperation and driving sustainable growth and jobs.

An important document underpinning the Rail Joint Border Crossing Station project is an agreement on establishment of border procedures for the railway border crossing at Tabanovce–Presevo. The official document was signed between the Minister of Transport and Communications of North Macedonia and the Minister of Construction, Transport and Infrastructure of Serbia to address the decisions of the EU Connectivity Agenda in 2015 at the Western Balkans 6 Summit in Vienna. Also in 2015, the EU Connectivity Agenda for the Western Balkans was adopted resulting in creation of the Transport Facilitation Working Group (TFWG). The TFWG was constituted by representatives of the six parties from the ministries in charge of the border police, trade, transport and customs, and the Chambers of Commerce of the parties as observers.

In 2017, the Treaty establishing the Transport Community was signed, establishing the Transport Community. The Transport Community is an international organization composed of the EU and the six Western Balkan parties, with the aim of enhancing the integration of the Western Balkans into the regional transport network. It promotes identification and development of priority transport infrastructure investments and ensuring harmonized legislation and standards in the field of road, rail, inland waterway, and maritime transport, thereby promoting stability, security, and economic development.

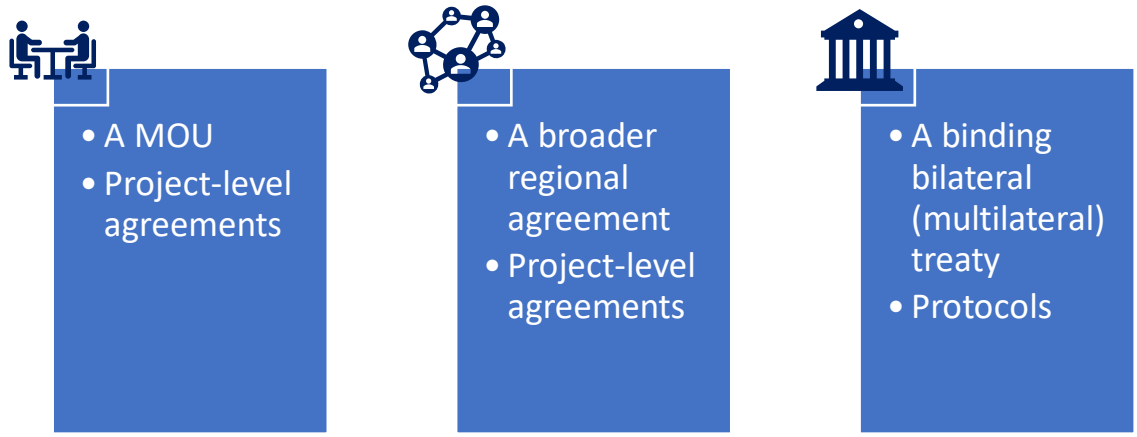
The Transport Community contributes to governance improvements by fostering the harmonization of transport regulations and standards across the Western Balkans, reducing administrative barriers, and enhancing cross-border cooperation. For instance, in Serbia, the Transport Community has facilitated the modernization of the Belgrade-Niš railway line, improving connectivity and fostering regional integration. In North Macedonia, the Community's efforts have led to the implementation of the EU transport safety standards.

The Transport Community also identifies priority projects of regional interest through developing a rolling work plan. This contributes to balanced sustainable development in terms of economics, spatial integration, environmental and social impact as well as social cohesion. The Rail Joint Border Crossing Station project was initially identified as part of the Transport Community Action Plan for this region.

Furthermore, the Rail Joint Border Crossing Station project was supported by the Western Balkans Investment Framework (WBIF). WBIF is a joint initiative of the EU, donor countries, multilateral and bilateral financial institutions, and beneficiaries, aimed at enhancing harmonization and cooperation in investments for the socio-economic development of the region. Under this initiative, the project received both investment grant and technical assistance which covered: needs assessment of cross-border station users; feasibility study and cost benefit

analysis; conceptual, preliminary, and main designs; environmental and social impact assessment; and tender documents.

Figure 2. Various forms of inter-government agreements



Source: Authors.

In some cases, multiple agreements have been signed over time with a subset of them being more effective. For the *Paraguay-Paraná Waterway* project, several agreements exist and have strengthened regional cooperation and integrated management of this important transportation route. Among these agreements, the "Fluvial Transport Agreement for the Paraguay-Paraná Waterway" stands out, signed by Argentina, Bolivia, Brazil, Paraguay and Uruguay in1992, during the event known as the "Santa Cruz de la Sierra Agreement." This agreement defines the institutional arrangement for the project and establishes that modifications or additions to the agreement be formalized through Additional or Modifying Protocols, thus promoting the flexibility and adaptability of the legal framework. It also defines the geographical scope of the Waterway, which helps harmonize the legal and regulatory frameworks.

A bilateral (or multilateral) treaty can provide stronger binding power and a more formal legal framework between countries than other agreements, paving the way for successful cross-border projects. Such a treaty defines specific roles and actions of countries covered and sets up institutional arrangements to implement the investment and monitor its progress. The benefits of a treaty or equivalent legal act are most salient for complex multi-country projects. For the SIEPAC project, an agreement to build new Central American electrical interconnection infrastructure was first signed in Madrid in 1987 with the support of the Government of Spain. The project was subsequently proposed in 1988. However, the concrete steps toward SIEPAC were taken only after the presidential summit in 1995, during which a consensus mandated for the drafting of a formal legal treaty that would take precedence over national laws. The Framework Treaty for the Regional Electricity Market was finally signed in 1996. The First and Second Protocols to the Framework Treaty were added in 1997 and 2007, respectively. In addition to establishing a legal basis for the creation of SIEPAC, the Framework Treaty stipulated that a regional institutional framework should be established with the legislatures of each country ratifying the Framework Treaty by law or decree subsequently.

Due to the multiple countries involved, regulatory risk is heightened in cross-border projects. An inter-government agreement can help address the differences at the policy and legal framework level. However, differences in regulations and standards create further barriers to projects or reduce their benefits during operation. For example, sponsor firms may encounter regulatory uncertainties in the form of differences in technical and operational standards, different restrictions on construction and engineering activities, or different land and procurement policies of the government involved. As another example, logistics companies may face different border crossing and customs procedures for transportation.

To counter these regulatory risks, successful cross-border infrastructure projects often harmonize regulation and standardize rules and standards. Regarding the *Integral Sanitation Program for the Cities of the Uruguay River Basin* project, both the province of Entre Ríos of Argentina, and the State Sanitation Works of Uruguay, a public Uruguayan company responsible for water and sanitation services, have defined investment plans to align their investment standards and complement the actions taken by each other and by other agencies in the past. In the case of the *Rail Joint Border Crossing Station* project, the project complies with the requirements of the soft measures for the creation of joint railway border crossing stations in countries in the Western Balkans to facilitate railway transportation. However, coordination and cooperation among several stakeholders such as police, customs, inspections were challenging. Therefore, all border agencies of both countries (representatives of the railway authorities, border police, customs, phytosanitary and veterinary) have signed Protocols on the establishment of procedures for joint work at the border crossing station.

Inter-government institutional arrangements

A formal inter-government institutional arrangement to coordinate implementation and decision-making is often necessary. Such an institutional arrangement can be instrumental in gaining political support to convince local political leaders to act and to execute the goals of the inter-government agreement. The institution functions as a political or administrative body that has responsibility to deliver, operate, and maintain the new cross-border asset. It can take key decisions, including both initial budget/investment approvals, as well as ongoing operations and long-term maintenance needs.

Inter-government institutional arrangements can also mitigate the asymmetry in government capacity, which often hinders project implementation as well as private sector participation. Cross-border projects demand strong governance capacity. Concerns about the competency of the public sector, corruption or uncertainties regarding investment regimes can limit the involvement of the private sector. Deficiencies in government contract management and monitoring ability can also be a challenge. Projects with long-term contracts, such as under public-private partnerships, face risks related to renegotiation of terms, thus necessitating clear dispute resolution mechanisms. Good governance and accountability are also needed to ensure that the public interest is well protected, including through consultation, and transparency in information and process.

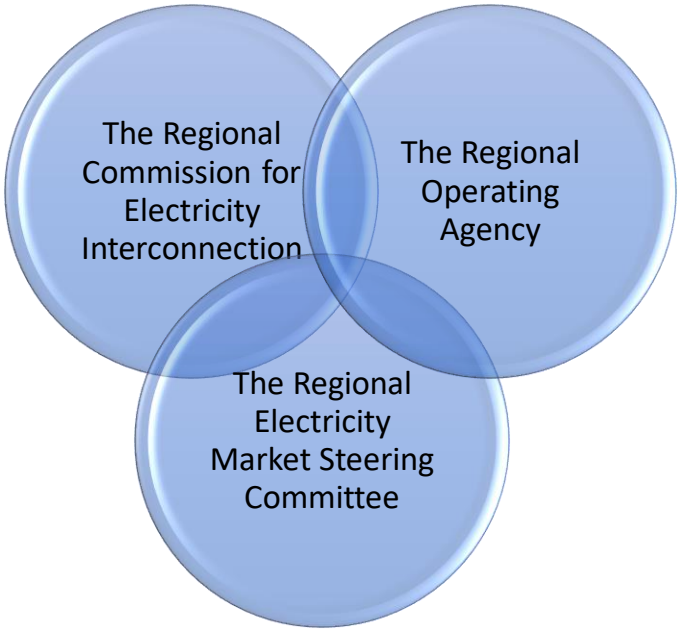
Indeed, as discussed below, successful cross-border projects rest on well-thought through institutional arrangements (see Box 3, for example, on the Middle Corridor project). This is true even for seemingly straightforward bilateral projects. One case is the *Integral Sanitation Program for the Cities of the Uruguay River Basin* project. To coordinate actions for preserving and restoring water quality in the shared stretch of the Uruguay River, a joint administration called the

Uruguay River Administrative Commission (CARU) was established. Formed by the Statute of the Uruguay River, it serves as an institutional mechanism for the optimal and rational utilization of the river. As one of the most important strategies within the framework of the Statute, CARU identified the need to implement a sanitation plan for the Uruguay River to mitigate the negative environmental impacts generated by discharges from riverside cities due to the lack of, or deficient, sewer systems and wastewater treatment.

The form of the arrangement varies. Loose coordination mechanisms, such as forums and platforms, can be effective institutions to facilitate the initiation of cross-border projects. They help to nurture a cross-border collaboration when the idea remains novel. Their value is especially pertinent in a challenging environment, such as growing geopolitical tensions, financial market turmoil, and macroeconomic downturns. A regional market as complex as SIEPAC was underpinned by forums for dialogue that promoted improvements to national systems and electricity sector agencies. The first phase of SIEPAC intended to take advantage of large hydroelectric project surpluses in the region (more than 1,500 MW between 1972-1983) and was developed in two blocks—the North Block, between Guatemala and El Salvador, and the South Block, between Honduras, Nicaragua, Costa Rica, and Panama—and resulted in the first binational interconnection between Honduras and Nicaragua in 1976. In the complex geopolitical environment of the 1980s, infrastructure expansion achieved under the support of SIEPAC's forums enabled significant surplus exchanges. In fact, this integration facilitation model has been coined as Regional Technical Dialogue Platforms and replicated throughout the Latin American region, resulting in the creation of the Andean Electrical Interconnection System (SINEA) in 2011, the Electrical Interconnection System in the Caribbean (ARCONORTE) in 2017, and the Southern Energy Interconnection System (SIESUR) in 2018.

The more formalized the coordination mechanism is, the more enforcement capacity the institution can have. As projects mature, the importance of formal inter-governmental institutions also grows. Some complex cross-border projects have formal and multifaceted coordination mechanisms. The second phase of SIEPAC ultimately established the multi-country infrastructure and created the Regional Electricity Market. For the second phase, the regional governing institutional structure includes: (i) the Regional Commission for Electricity Interconnection, which is comprised of regulators from the six countries and regulates the commercial relations between the agents that connect to the regional electricity system and sets energy exchange and transport payment and price mechanisms; (ii) the Regional Operating Agency, which is comprised of the operators of the six electricity systems and responsible for coordinating the technical and commercial operation of the energy exchanges between the agents as operator and administrator of the electricity system and regional market; and (iii) the Regional Electricity Market Steering Committee, which is the political body responsible for promoting the development of the regional market and facilitating compliance with the objectives of the Framework Treaty and its Protocols as well as coordinating the interrelationship with and among the rest of the regional organizations (Figure 3).

Figure 3. The regional institutional structure governing SIEPAC



Source: authors based on - Central American Electrical Interconnection System. C Echevarria, N Jesurun-Clements, J Mercado, C Trujillo

While the institutional arrangements aim to mitigate asymmetry in government capacity, the imbalances in state capacities and uncertainties in political support require clear monitoring, verification, reporting, and conflict resolution mechanisms. For SIEPAC, rules and procedures regarding disputes, oversight, and monitoring of the regional market, as well as a sanctioning regime are established. The Regional Commission for Electricity Interconnection takes the leading role in implementation in its capacity as regional regulator of the electricity market. The Commission has also developed a catalog with "Data for Market Surveillance" that must be submitted by all entities and agents. This, along with any additional information requested by the Commission, makes it possible to detect conduct or activities indicative of non-compliance with the regulations; anomalous behaviors or inappropriate market conduct; shortcomings and inefficiencies in the regulations; and failures and inefficiencies in the design and structure of SIEPAC. The findings of these or other analyses are periodically reported to the market.

For the *Paraguay-Paraná Waterway* project, the countries involved established the Intergovernmental Waterway Committee as its political body and created the Agreement Commission to monitor compliance and propose necessary measures. While the framework provides a platform for collaboration, there are disparities in terms of financial resources, technical expertise and administrative capabilities between participating nations. Furthermore, while conflict resolution mechanisms exist, disparities in state capabilities can influence the effectiveness of these mechanisms.

Box 3. Inter-government Arrangements and Governance on the Middle Corridor

The Middle Corridor, also known as the Trans-Caspian International Transport Route (TITR), is a major transportation and trade route that connects East Asia with Europe, traversing several key countries in Eurasia. The route begins in China, primarily using the infrastructure in its western regions, and passes through Kazakhstan, leveraging its extensive railway network. Goods are then transported across the Caspian Sea, typically from the port of Aktau in Kazakhstan to the port of Baku in Azerbaijan. From Baku, the route continues via rail through Azerbaijan and Georgia, reaching the Georgian ports on the Black Sea for shipping onwards to European ports, or the Georgian-Turkey land border for rail transportation to Europe.

As the corridor traverses through multiple countries and regions, a key consideration for effective operations relate to governance arrangements and operational alignment. In 2023, a trilateral agreement was signed between Kazakhstan, Azerbaijan, and Georgia to establish a **joint logistics company**, involving national railway companies. The Middle Corridor Multimodal Ltd., registered at the Astana International Financial Center (AIFC), aims to enhance multimodal operations along the Middle Corridor. The operations are expected to commence later in 2024, and Turkey can potentially join the venture in 2025.

In addition to the commercially oriented joint venture, there are multiple other bilateral and multilateral agreements, regional organizations, and partnerships that aim to enhance cooperation, infrastructure development, and trade facilitation among the countries along the route. Various bilateral agreements, including between China and Kazakhstan, Azerbaijan and Georgia, Turkey, and Georgia, address specific aspects of cooperation, including on transport, customs, and infrastructure development. Key multi-country governance arrangements include:

- **Trans-Caspian International Transport Route (TITR) Association:** Formed in 2014, the TITR Association includes railway, port, and shipping companies from Azerbaijan, Georgia, and Kazakhstan, with Turkey joining later. It aims to develop a synchronized and efficient transport system along the Middle Corridor, coordinating policies, schedules, and tariffs to facilitate smoother transit.

- **Baku-Tbilisi-Kars (BTK) Railway Agreement:** Azerbaijan, Georgia, and Turkey are the participants to this agreement, which focuses on the construction, operation, and management of the BTK railway, a critical segment of the Middle Corridor that enhances connectivity between these countries and further into Europe.

- **Belt and Road Initiative (BRI):** As the initiator of the BRI, China has signed numerous bilateral agreements with countries along the Middle Corridor to invest in infrastructure projects, such as railways, ports, and logistics centers.

- **Economic Cooperation Organization (ECO):** Members include several Middle Corridor countries like Turkey, Azerbaijan, Kazakhstan, and others. It works to promote economic, technical, and cultural cooperation, including transportation infrastructure and trade facilitation in the region.

- **TRACECA (Transport Corridor Europe-Caucasus-Asia):** Members include countries from Eastern Europe, the Caucasus, and Central Asia. Initially supported by the European Union, TRACECA aims to develop a transport corridor connecting Europe

with Central Asia through the South Caucasus, aligning with the Middle Corridor's objectives.

- **Organization of Turkic States (OTS):** Members include Azerbaijan, Kazakhstan, Kyrgyzstan, Turkey, and Uzbekistan. OTS has a special emphasis on bolstering transport linkages among the member states across the Middle Corridor through the removal of the existing obstacles to efficient, stable and seamless transport and the establishment of new mechanisms to streamline transport operations in all transport modes.

There are also targeted alliances and partnerships. For example, ports in Kazakhstan and Azerbaijan cooperate to enhance port facilities, improve cargo handling capacities, and establish regular ferry and shipping services across the Caspian Sea. Initiatives like the Eurasian Economic Union (EAEU) and agreements between customs authorities of the corridor countries aim to simplify customs procedures, implement single-window systems, and enhance cross-border cooperation. Additionally, investment partnerships with international financial institutions focus on funding infrastructure projects, provision of technical assistance and implementation of public-private partnerships along the corridor.

Agreements and Governance for Soft Connectivity Components

The Middle Corridor countries are participants to multiple international conventions, governing transport operations. The Transports Internationaux Routiers (TIR) Convention is administered by the United Nations (UN) Economic Commission for Europe and facilitates cross-border trade using a standard, internationally recognized customs document and transit guarantee called a TIR carnet. It is one of the most important enablers of smooth international operations, as it allows trucks operating under a TIR carnet use one single international guarantee along the corridor, including for intermodal transport, if all corridor countries are participants to the convention. On a similar note, the UN Convention on the Contract for the International Carriage of Goods by Road (CMR) covers the rules for transporting goods internationally and the consignment note documents information about the shipped goods, and participants to the transaction. The most recent development for TIR and CMR Conventions relates to digitalization of transport documents, which lowers transaction costs. The pace of implementation of e-TIR and e-CMR differs between the countries along the Middle Corridor, limiting the potential benefits.

The harmonization of standards between countries and their proper enforcement are important for efficient international transport operations. One of the key governance arrangements for road transportation is the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). While some corridors along the Middle Corridor have acceded to the agreement, some are at an early stage still need to ratify it, which implies differences in treatment of such goods at the border crossing points. This results in higher transaction costs for the shippers, given lack of a standard approach. The weight and dimension standards are usually governed by national rules and authorities, however different standards may cause operational disruptions along the corridor.

The Trade Facilitation Agreement (TFA) of the World Trade Organization contains provisions for expediting the movement, release and clearance of goods, including in transit. The pace of implementation of measures to support full TFA implementation and reduce non-tariff barriers varies between countries, limiting the realization of full benefits from the agreement.

3.3 Finance and Management

The financial structure of a cross-border project depends largely on the project itself, considering its sector, technology, and the countries involved. These projects typically face a set of higher risks—including geopolitical, socio-environmental, climate change, demand fluctuations, and currency exchange rate volatility making them more challenging and expensive to finance with private resources.

Direct government support can take various forms, including capital contribution through the direct participation of national public companies, the establishment of dedicated public project companies, and infrastructure financing by each country based on its national requirements.

In addition, MDBs play a crucial role by providing long-term and concessional financing, which helps to mitigate many risks. MDBs contribute by setting international standards throughout the project cycle, enhancing transparency, competitiveness, and accessibility. Their concessional resources lower project costs, and their long-term sovereign debt financing ensures sustainability and facilitates the establishment of ad-hoc investment recovery mechanisms. An example of such a mechanism is seen in the cross-border project, SIEPAC where regulators agreed to a tariff-based repayment scheme with a complementary charge that ensures full repayment of project commitments, including return on investment. The contribution of countries in the financing of cross-border projects is traditionally defined by the size of the infrastructure within their territories and, to a lesser extent, by the distribution of the expected benefits during the project's operation.

Depending on the project's governance, the involvement of MDBs can also facilitate private financing through guarantees, grants, or long-term sovereign-guaranteed loans. These sovereign-guaranteed loans act as a risk mitigation mechanism for the private sector. Ultimately, MDB participation helps ensure the design of an optimal financial structure that adheres to national policy parameters, provides value for money, reduces risk, competitively determines financing requirements, and mitigates contingent liabilities.

Due to the nature and the level of risks of cross-border projects, the greatest contribution of the private sector has been observed mainly in the design, construction, operation, and maintenance phases and to a lesser extent in the financing phase. Countries with fiscal risks, associated with high debt levels and poor credit ratings, find it more difficult to engage in cross-border projects. In these cases, the fiscal or debt contributions from MDBs are limited by other government priorities, which can delay or render the development of cross-border infrastructure—and the benefits they provide—unviable.

The *Monsoon* project provides a useful example to understand the financial structure, key risks, and private capital mobilization associated with a cross-border energy infrastructure. The total project costs are estimated to be USD 946 million. The sources of funds for the project are summarized in Table 1 below.

ADB administered concessional financing of USD 50 million and a $10 million grant from ADB's Asian Development Fund to fill a curtailment debt service reserve account that the borrower could use to partially mitigate repayment risk to senior lenders in case of extreme curtailment (noting that under the project's power purchase agreement, the output of the project can be curtailed, or restricted for technical reasons). This account would provide funds to cover a portion of debt service in periods where extreme curtailment results in insufficient cash for the borrower to repay

senior lenders. ADB agreed upon this structure with the borrower ahead of launching the syndication to bring a bankable project structure to market.[10]

Table 1: Financing Overview of Monsoon Project

Sponsors	BCPG Public Company Limited, Impact Electrons Siam Group, Mitsubishi Corp, SMP Consultation Sole Company Limited, ACEN Renewables International
Estimated Total Costs	USD 946 million
Total Financing	USD 692.55 million
Financing Plan	• ADB A Loan USD 100 million • Concessional Financing USD 50 million • Syndicated B Loan 150 USD million: Siam Commercial Bank USD 100 million Sumitomo Mitsui Banking Corporation USD 50 million • Parallel Loans 382.55 USD million: Japan International Cooperation Agency USD 120 million Kasikorn Bank USD 100 million AIIB USD 72.55 million Export-Import Bank of Thailand USD 60 million Hong Kong Mortgage Corporation Limited USD 30 million • ADB's Grant USD 10 million: To help mitigate key project risks, including potential curtailment risk.

Source: Authors.

The use of concessional blended finance was critical in overcoming the project's bankability hurdles and crowd in the commercial capital. With the syndication of development and commercial financing, the project is able to bring in private capital to develop wind resources and to boost economic and social advancement in the region.

The *Rail Joint Border Crossing Station* illustrates the types of barriers and risks to financing arise due to the cross-border nature of these projects. The project requires close cooperation between the authorities of both countries to ensure smooth operation of the joint rail border crossing station. This means that political will from both countries was required from the outset. The nature of the Project also required an agreement between the two countries to be signed in order to obtain the financing and make the necessary project implementation and operation arrangements both on Macedonian and Serbian territories with implementation responsibility of the Macedonian institutions, raising implementation risks. In addition, coordination and cooperation among several stakeholders such as police, customs, inspections were challenging.

The question of how these risks were mitigated and managed is crucial for cross-border projects. During the feasibility study preparation, beneficiaries from both countries jointly carried out the assessment of the needs of the joint station (such as space, equipment, and services), which helped in planning its implementation accordingly. The previous work of the EBRD with the

[10] 55205-001: Monsoon Wind Power Project | Asian Development Bank (adb.org)

relevant Ministry in previous rail projects helped further mitigate implementation risks. In addition, as part of the Project, a project implementation support consultant will be provided to support the project implementation unit ("PIU") that will be established for the Project. Moreover, the application of EBRD Procurement Policies and Rules ("PP&Rs") will ensure that an experienced and qualified contractor is selected to perform the work.

Sustainable cross-border infrastructure refers to infrastructure projects that are planned, designed, constructed, operated, and decommissioned in a way that ensures economic and financial, social, environmental (including climate resilience), and institutional sustainability over the entire project's life cycle. These investments avoid negative impacts on the environment, enhance the quality of life of local communities, stimulate economic growth and productivity, and promote climate-resilient infrastructure assets. However, many developing countries lack access to the capital needed to meet nature and climate targets in cross-border projects. Fiscal space constraints severely limit a country's capacity to invest in additional biodiversity and climate ambition. Countries require proper debt instruments and strategies to act while navigating higher debt levels, which are further compounded by increasingly frequent and costly climate-induced shocks acting through multiple transmission channels (Scatigna et al., 2021).

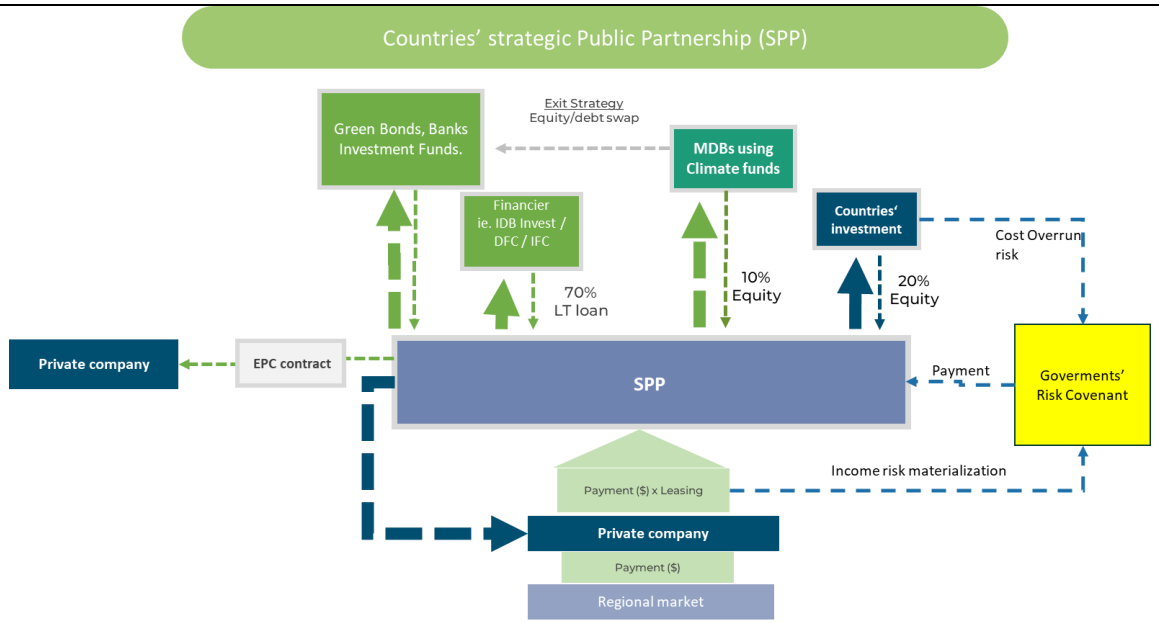
The various case studies presented in this report consistently show the importance of public financing and the contribution of MDBs to realize the development of sustainable cross-border projects. The climate agenda imposes new requirements for resilience, biodiversity, and emissions reduction for the sustainable development of cross-border projects, which demand greater resources. However, the continued deterioration of the fiscal situation in many countries has, for years, hindered the timely financing of cross-border projects and has, at the same time, inhibited greater contributions from the private sector.

Taking advantage of "The G20 Roadmap for the implementation of the recommendations of the G20 Independent Review of Multilateral Development Banks (MDBs)' Capital Adequacy Frameworks (CAF)", there is a valuable opportunity for MDBs to contribute even more to the development of cross-border projects, with innovative schemes, especially in those countries facing fiscal challenges, by directly bringing climate funds in cross-border project development, reducing public financing and generating confidence to ensure private resources.

Under this scheme (Figure 4), governments are expected to agree to the implementation of risk mitigation mechanisms that facilitate financial structuring where climate funds invest directly in cross-border projects. These types of schemes allow the empowerment of the public sector to be maintained in the development of cross-border projects and reduce stress on fiscal space, while favoring the participation of private resources.

The next section distills some general policy lessons from the above discussion, while also providing some specific recommendations for cross-border infrastructure projects related to energy, transport, water and nature (Boxes 4, 5 and 6).

Figure 4. Strategic public financing to leverage private resources and the use of climate funds



Source: Authors.

4. Recommendations

The recommendations below are broad in nature and application should be balanced in the context of each country. The specific circumstances of countries will affect how each recommendation is adapted and applied, and how it aligns with the G20 Compendium of Quality Infrastructure Indicators.

4.1 Economic Rationale and Planning

The following steps depict the recommended general structure for the planning stages of a well-designed cross border projects:

1. Develop a Vision

- Develop a regional infrastructure plan or a regional economic plan among participating countries to support long-term strategic planning through agreements on project prioritization and coordination.
- Adopt long-term planning, to allow for interactive and continuous coordination and cooperation between project owners and funders, informed decisions, and the identification of priorities for funding mechanisms. A long-term perspective also promotes the efficient use of cross-border infrastructure.

2. **Mobilize Cross-Border Planning Team**

- Mobilize resources and technical experts from each participating country in charge of preparing aligned project investments.
- Conduct a feasibility study to understand the benefit-cost ratio of the cross-border infrastructure projects, and identify environmental, social, and economic risks.
- Prepare a financial plan with detailed operations and maintenance budgeting outlook to seek public and private investments.

3. **Engage Stakeholders**

- Conduct multiple rounds of stakeholder consultation with the national authorities including, but not limited to, ministries in charge of infrastructure projects, economy and finance, infrastructure agencies and operators, and customs and border agencies, as well as regional and international users and relevant regional and international associations.
- Consult early and continuously from private sector, civil society, and affected communities of cross-border infrastructure projects.

  Based on stakeholder consultations, define actions for stakeholders to implement. Actions should be specific, concrete, implementable and realistic. They should consist of both hard infrastructure measures (construction, modernization, rehabilitation, or acquisition of physical assets), and soft measures (legal/regulatory, policy, institutional, bilateral/multilateral agreements, digitization).

4. **Understand Cross-border Benefits and Costs**

- Besides the common practices adopted in CBA, a special focus for cross-border infrastructure is to identify and value the additional benefits arising from regional cooperation, including the facilitation of technology transfer alongside the increased foreign direct investment, efficiency gains from regional specialization based on selling in a larger market, and so on.
- For cross-border projects, benefit valuation should distinguish between benefits accruing to citizens and stakeholders of different countries.[11]

4.2 Political Support and Governance

The following steps are key in terms of garnering political support for cross-border infrastructure and for instituting a strong governance mechanism:

1. **Demonstrate Strong Political Support, including by Signing a Cooperation Agreement**

- Generate high-level political support, which generally leads to policy alignment and/or inter-government institutional arrangements.

[11] Guidelines for the Economic Analysis of Projects (adb.org)

- Sign a Cooperation Agreement by high-level political decision makers to support the vision and strategic plans.
- Leverage an external independent actor such as MDBs and international organizations to help facilitate coordination between participating countries and overcome 'zero-sum game' mentality of individual countries to bring cross-border and regional benefits, in addition to providing planning and advisory support, mobilizing both public sector and private sector financing, and helping establish a cross-border commission (see below).

2. Ensure Policy, Legal, and Regulatory Alignment

- Align laws, regulations and standards early. Cross-border projects often face the challenge of different country-level policy and planning frameworks. Misalignment creates further barriers to a project or reduce its benefits during operation. For a cross-border project to succeed, it is important to reconcile these "soft" issues as early as possible.
    - For this, inter-government project agreements are important, providing greater certainty but with varying degree of binding powers: e.g., a memorandum of understanding or a legal commitment act.
    - Harmonization of legal and regulatory frameworks is crucial: e.g., regulations related to PPA or electricity tariffs for energy; regulations related to environmental and social considerations.
    - Standardization of rules and standards is also needed: e.g., border crossing and customs procedures for transportation; technical design and operational standards.

3. Address Gaps and Differences in State Capacity

- Understand and address the challenge of state capacity, especially unbalanced capacities between countries involved and uneven human resources allocation and capacities across relative government agencies within a country.
- Build effective inter-government institutional arrangements, especially for a complex project and in the context of significant state capacity gaps:
    - The institutional arrangements can be formal or informal and can rely on existing domestic or international institutions.
    - The inter-government institution requires authorities, resources, and capacities commensurable to its corresponding functions and mandates, in particular, supervision and/or coordination.
    - It should have conflict prevention and resolution as part of its mandates.
    - MDBs, IOs and other external institutional support can be utilized in the design and development of the institution.
    - The internal capacities of the institution should grow along with the project and the arrangement can be revised along the project cycle as well.

- One powerful option is to establish a cross-border commission as a single entity which may be bilateral or multilateral. It would function as a political / administrative body that has responsibility to deliver, operate, and maintain the new cross-border asset. It would take key decisions, including both initial budget/investment approvals, as well as ongoing operations and long-term maintenance needs. The more formalized the coordination mechanism is, the more enforcement capacity the Commission can have. The risk of not having the Commission is a risk to asset condition over time.

4.3 Finance and Management

The following are some considerations when designing the financial and management structure of cross-border projects:

1. **Ensure a financial structure with strong government ownership and MDB support to leverage private capital**

- Provide direct public support, together with MDB financing where possible, to ensure an optimal risk mitigation facility to sustain the project throughout the life cycle. Due to specific risks associated with cross-border projects, an adequate policy framework with a defined scheme for decision-making at the project entity level is critical to mobilize private financing. Unaddressed risks reduce the appetite for private capital or impose a heavy premium on the cost and type of financing.
- Leverage the proactive participation of MDBs to help set international standards throughout the project cycle, enhance transparency, competitiveness, and accessibility in addition to providing long-term and concessional financing, which helps to reduce fiscal costs and mitigate risks.
- Develop a financial structure that fits the project. The optimal financial structure of a cross-border project depends largely on the level of commitment of the countries involved, therefore it needs to demonstrate the central role of governments, facilitating the implementation of risk mitigation mechanisms, without stressing necessarily fiscal resources as the main source of financing. Effective risk mitigation can be enhanced through guarantees provided by MDBs. These instruments have the potential to mobilize private financing and minimize the direct fiscal support needed to achieve an optimal financial structure.[12]
- Consider creating a dedicated project company governed by private law and vested with powers by the governments, to facilitate the successful design of financing mechanisms with the support of MDBs and ensure the proper management of cross-border infrastructure. This type of scheme in existing cross-border projects allows for maintaining the empowerment of the countries in the projects and opens the opportunity to incorporate private financing in the expansion or rehabilitation of the infrastructure in the long term.

[12] For a detailed discussion on the role of MDBs in providing guarantees to mitigate risks and mobilize private resources, refer to the previous work developed for the G20 IWG under the "Infrastructure as an Asset Class" workstream: *Introductory Guide to Infrastructure Guarantee Products from Multilateral Development Banks.*

- Explore ways to generate additional private funding. Once cross-border projects reach their operational phase and overcome key challenges—such as securing government commitment, mitigating risks, establishing proper governance, and achieving a robust financial structure——a stable revenue stream is essential to make these projects attractive to institutional and other investors. Additional private funding can come from various sources, including user tariffs and commercial revenues. Moreover, transferring the operation of the assets through PPP agreements, when feasible, may further mobilize private resources.

2. Leverage biodiversity and climate targets to mobilize climate funds when possible

- Use concessional access to climate funds to play a catalytic role by facilitating the use of greater contingent resources and, in collaboration with MDBs, to provide direct support to projects, reducing the stress on public financing and leveraging private resources. This is important as fiscal space constraints often severely limit a country's capacity to invest in additional biodiversity and climate ambition of cross-border projects.
- Motivate the development of cross-border projects by common interests and shared benefits rather than by the amount and proportion of the countries' investment.
- Safeguard long-term sustainability in the long term but also address the lack of affordability of the service provided when designing finance and management of cross-border projects. This is where the joint contribution of governments, MDBs, and climate funds makes it possible to reduce investment costs while facilitating private resources.

Box 4. Specific Suggestions for Cross-Border Transport Projects

- Develop a **formal network management institution** with a decision-making body to ensure regulatory harmonization and operational facilitation in participating countries. A joint operating committee could facilitate communication and ensure coordination in planning, prioritization, and implementation.
- Establish a **coordinated border management system**, supported by national border control agencies. This could bring many advantages, including the efficient delivery of services, as well as better harmonization of practices and policies by different agencies.
- Adopt a **unified tariff under a single payment platform** to enhance the efficiency of operation.
- **Share data and information** widely to allow for the introduction of better risk assessment and management practices, enabling efficient delivery of facilitation and intervention programs.
- Institute separate **policymaking, control and licensing, and operations in each participating country** to enhance private-sector participation, improve efficiency and transparency, support regulatory adherence, and increase competitiveness.
- **Consult stakeholders to prioritize investments and projects**, considering the following criteria:1) improved transit time and/or reliability on the route, 2) increased route capacity, 3) increased route competition and/or more options for shippers, 4) greater network reach (including increased interconnectivity to other modes) within one country, 5) greater network reach (including increased interconnectivity to other modes) within multiple countries, 6) enhanced interoperability/operating efficiency between participating countries, and 7) potential for GHG reduction impact.

Box 5. Specific Suggestions for Cross-Border Energy Infrastructure Projects

- Clearly identify **energy complementarity** between the countries/economies, especially in the early stages.
- Ensure **strong government endorsement and involvement**. Besides the inter-government agreement providing overarching arrangement regarding cross border coordination and implementation agreement, it is important to have clear fuel supply agreement, offtake agreement, etc. for energy projects.
- Develop **clear dispute resolution mechanisms** to address risks faced by such projects with long-term contracts, notably those related to renegotiation of terms and tariffs.
- Prepare appropriate **measures to mitigate curtailment risk** (lower than forecasted demand) such as concessional financing, especially in the case of renewable power projects (e.g., wind power).
- Improve **electricity demand forecasting** through advanced modeling techniques and predictive analysis.

Box 6. Specific Suggestions for Cross-Border Water and Nature Infrastructure Projects

Today, under the global climate crisis and coupled with fast-growing economic development and urbanization, water security is undoubtedly a common challenge worldwide to ensure sustainable and resilient development. Since many river basins are shared between countries, cooperation is needed to manage water resources effectively and avoid conflicts.

In the case of the Latin American and Caribbean (LAC) region, approximately 71% of total surface water is originated in transboundary basins, where 40% of the total population lives, covering 60% of the territory. In South America, there are 38 transboundary basins and 29 in Central America. This region is home to the world's biggest aquifer (Guaraní) and the biggest wetland (the Pantanal ecoregion). Nonetheless, 140 cities with accelerated growth in the LAC region would double its population in 20 years, within a context where basic services such as water, sanitation, and waste management are still a pending debt for millions of people. On top of that, the region has shown high vulnerability to global stressors as the COVID-19 pandemic and climate change impacts, especially those related to extreme events like droughts and floods are exacerbating water security challenges.

To better understand the importance of the transboundary systems in LAC, just the Amazon hydrographic region itself, is the greatest repository of biodiversity in the world, home to around 10% of all the world's known species of plants and animals. It contains nearly half of all trees found in the world's tropical forest regions, perhaps 16,000 species in total. The Amazon Basin plays a critical role in global water and biogeochemical cycles. Its rivers hold one-fifth of all the freshwater of the planet; the average drainage volume of the basin exceeds 6.5 km^3/year, which represents over 70 percent of the freshwater discharge in Latin America and approximately 20 percent of the planet's freshwater discharge.

However, these precious ecoregions are under increasing stress and threats to their water security conditions, putting into risk the sustainable socio-economic development of LAC countries. Nowadays, the LAC region is facing important challenges in terms of water security that call for action. As an example, is expected that 40% of the LAC region will suffer water stress by 2050. This would impose negative effects in terms of human migration to avoid extreme droughts and intense rains; outbreak and dispersion of zoonosis; agricultural and industrial production and hydropower generation, among others. Some of those challenges include water pollution which degrades the water quality of valuable sources for human consumption; the expansion of cities and land use changes that increase erosion; the loss of biodiversity and hydroclimatic ecosystem services as a consequence; and finally, climate change and increasing hydro-climatic events.

In this context, the lack of effective governance frameworks for the protection and coordinated management of transboundary water resources is a key aspect. Moreover, there is a need for strategic planning between water, food, and land interconnections.

Integrated management of water resources in transboundary basins is crucial for ensuring water security; but it is also essential for promoting peace, stability, and sustainable development in the LAC region, ensuring that water remains a source of cooperation rather than conflict. It allows countries to develop increased value from shared water resources through collaboration, such as irrigation, hydropower, flood control, and environmental protection. In addition, it enables addressing shared challenges like water pollution, deforestation, climate change impacts, and lack of financing mechanisms.

Clearly, cross-border water management is a critical issue that requires careful consideration and cooperation among neighbouring countries. Here are some specific suggestions for countries to address cross-border water challenges:

1. Establish **bilateral or multilateral agreements**, among neighboring countries, to govern shared water resources. These should cover usage, allocation, and management, with clear rules and methods to resolve disputes.
2. Implement **joint monitoring programs** to facilitate data sharing among countries to promote transparency and informed decision-making.
3. Establish **Transboundary Water Institutions** tasked with facilitating cooperation, managing conflicts, and implementing joint water management initiatives. These should be inclusive, transparent, and accountable to all riparian states.
4. **Invest in infrastructure and technology** to improve water efficiency, quality, and fair distribution among riparian states. This can involve building dams, reservoirs, wastewater treatment plants, and irrigation systems.
5. **Strengthen legal frameworks** governing transboundary water resources and establish effective dispute resolution mechanisms to address conflicts that may arise over water allocation, pollution, or infrastructure development.
6. Seek **international support and funding from donor agencies**, development banks, and regional organizations to finance cross-border water management initiatives, capacity-building activities, and infrastructure projects.

Based on IDB's experience from its Transboundary Waters Program "Joined by Water", the following recommendations are proposed for international agencies supporting cross-border water and nature infrastructure projects:

1. Adopt a **comprehensive approach** to support countries in their efforts to develop and implement cooperation mechanisms on transboundary water cooperation and management, considering: 1) governance and institutions strengthening; 2) capacity building; 3) science, technology, and data; and 4) resilient innovative financing.
2. Undertake **transboundary water diagnostic analysis** using hydrological modeling tools to achieve a truly transboundary perspective and focus on major basin issues.
3. Based on the results of the diagnosis, develop **data exchange mechanisms and prioritization** of agreed cause-effect mechanisms between countries sharing water resources.
4. Provide **direct capacity development and training** for specific aspects of transboundary water management, targeting decision-makers and those involved in management planning and implementation at different government levels.
5. Promote **involvement of academia and community-based data gathering**.
6. Develop **integrated water resources management plans**, including information gathering, planning, and infrastructure development (green and grey) for shared water basins.

5. Case Studies of Selected Cross-Border Infrastructure Projects

5.1 Central American Interconnection System – SIEPAC

SECTION A: Project Overview

- Sector: Energy
- Countries or economies involved: Central America: Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama
- Stated objective: Strengthen regional cooperation in the energy sector to improve exchanges of electricity through the construction of dedicated regional infrastructure and the creation of the regional market and its institutions.
- Main components: C1- Development of the SIEPAC infrastructure; C2- Design of the institutional, legal and regulatory architecture of the regional market (MER).
- (Estimated) Project cost: US$505 M
- Financing arrangement: Public and private
- Expected/Actual year of commercial operation: In operation since 2014
- Project outcomes, impact, and other highlights:

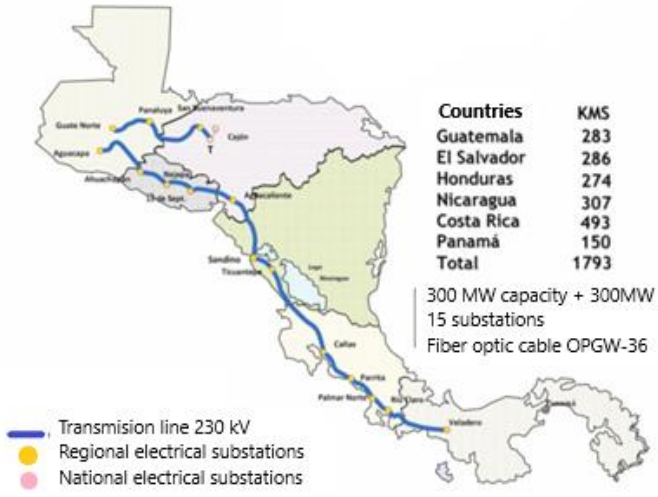
  A formal regional electricity market (MER) created with dedicated regional institutions.

  More than 300 private market agents trading in the MER

  Energy exchange increased ten-fold exceeding 3,000 GWh per year

  An ex-post cost-benefit analysis carried out in 2016, considering electricity trade from 2013 to 2015, determined US$156.2 million of economic benefit. The distribution of these benefits resulted in 70% for Guatemala (the main exporter), 11% for Costa Rica, 9% for Panama, and 10% among the other countries.

- Map(s) of the project:



SECTION B: Economic Rationale and Planning

- Positive and negative externalities:

  1. **The complementarity or competition between countries**. The interconnection infrastructure was developed in two major phases. Phase one intended to take advantage of large hydroelectric project surpluses in the region with the development of binational interconnections. During the second phase, the SIEPAC was developed as an 1,800 km, 230 kV, single-circuit line interconnecting six countries that enabled a second circuit to be installed in the future, in addition to the installation of a fiber optic cable, thereby creating a continuous channel for regional energy exchange and digital connectivity.

  2. **The distribution of costs, benefits, and impact between countries**. An update of the cost-benefit analysis from 2011 reconfirmed that a high degree of integration, with an average growth in demand, showed benefits of up to US$ 953 million, of which 80% would be associated with substitution of investments in local generation and 20% at lower generation costs. Likewise, the long-term average incremental cost (CIPLP) would be reduced by 9.5 US$/MWh between 2011-2025. This analysis estimated that an increase in the SIEPAC transmission capacity from 300 to 600MW, as well as the interconnection of Colombia, would allow the CIPLP to be further reduced by an additional 4.4 US$/MWh. The analysis determined that about 25.7 million tons of CO_2 emissions would be avoided. An ex-post cost-benefit analysis carried out in 2016, considering only electricity trade from 2013 to 2015, determined the benefits for each country based on the efficiency and savings in production costs for importers, as well as the surplus of exporters totaling US$156.2 million. The distribution of these benefits resulted in 70% for Guatemala (the main exporter), 11% for Costa Rica, 9% for Panama, and 10% among the other countries.

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment

  The regulatory architecture that enabled the development of the regional electricity market was set up gradually, with each country's legislature ratifying it by law or decree. In tandem with the binational interconnection process, and given the major progress being made in the region's peace processes, the Spanish government proposed making a strong push for electrical interconnection among the six countries. In October 1987, an agreement to build new Central American electrical interconnection infrastructure was signed in Madrid. The SIEPAC project was subsequently proposed in 1988 and with the support of the IDB, the final design was completed in 1995. The presidential summits held in 1995 were an important milestone that enabled the first steps toward the creation of the Regional Electricity Market. The summits resulted in a consensus mandate for the drafting of a formal legal treaty that would take precedence over national laws. The Framework Treaty for the Regional Electricity Market was finally signed on December 30, 1996, in Guatemala. The First and Second Protocols to the Framework Treaty were added in 1997 and 2007, respectively.

- State capacities, conflict resolution, and inter-government institutional arrangement

  The Framework Treaty, its protocols, and the regulations are instruments that, in addition to defining the operating rules for the MER, establish a regional institutional structure that includes: (i) the Regional Commission for Electricity Interconnection (CRIE), which is comprised of regulators from the six countries; (ii) the Regional Operating Agency (EOR), which is comprised of the operators of the six electricity systems; and (iii) the MER Steering Committee (CDMER), which is the political body responsible for promoting the development of the MER and facilitating compliance with the Framework Treaty as well as coordinating the interrelationship with and among the rest of the regional organizations.

SECTION D: Finance and Management

- Funding sources and financial structure:

  The financial structure was conceived around the creation of the network owner company (EPR). EPR was incorporated in Panama as a company governed by private law and vested with powers by the governments of the six Central American countries. Its shareholders include the electricity transmission companies of each country,[13] as well as three extra-regional companies.[14] EPR's function has been to develop, design, finance, build, operate, and maintain the SIEPAC. In keeping with the mandate laid out in its 1999 incorporation, EPR is responsible for operating and maintaining SIEPAC for 35 years. The creation of EPR made it possible to design an initial public financing scheme that then enabled a long-term sustainable rate-based financial mechanism to be added. Nine partners—approximately US$6.5 million each—as well as a series of loans totaling US$446.54 million from the IDB, CABEI, CAF, BANCOMEXT, and DAVIVIENDA, and direct financing from INDE, CEL, and ETESA, with an average grace period of 25.8 years, at an average annual interest rate of 3.5%.

- The role of the public and private sector:

  The creation of the EPR with equity of each public utility allowed the engagement of governments to carry out the project, ensure the rest of the financing, and agree on the repayment mechanism. EPR can cover the debt service, as well as management, operation, and maintenance costs, taxes, and annual regulated profits for the shareholders thanks to guaranteed payments from the MER, through the Regional Authorized Revenue (IAR), which is approved in November of each year by the CRIE. Whatever is needed to round out the IAR for the month is paid by all MER agents requiring energy (local or from the market), in proportion to their total energy demand. If there were no revenue from variable transmission costs, or from the sale of transmission rights for a segment of the network, the supplementary charge would be equal to the monthly IAR. This mechanism has ensured the timely inflow of revenues to make repayment of debt and profits for each of the shareholders and built trust in the EPR's creditworthiness, prompting CABEI and IDB Invest to agree, in 2018, to a commercial credit line to continue financing infrastructure for both regional transmission reinforcements and a second SIEPAC circuit, and in doing so, reduce the need for sovereign debt contributions from member countries going forward.

  The creation of the MER for exchanges of surplus energy in the spot market during the first years has resulted in a majority participation of private market agents (>300) who take the risk of market transactions inherent to the spot market.

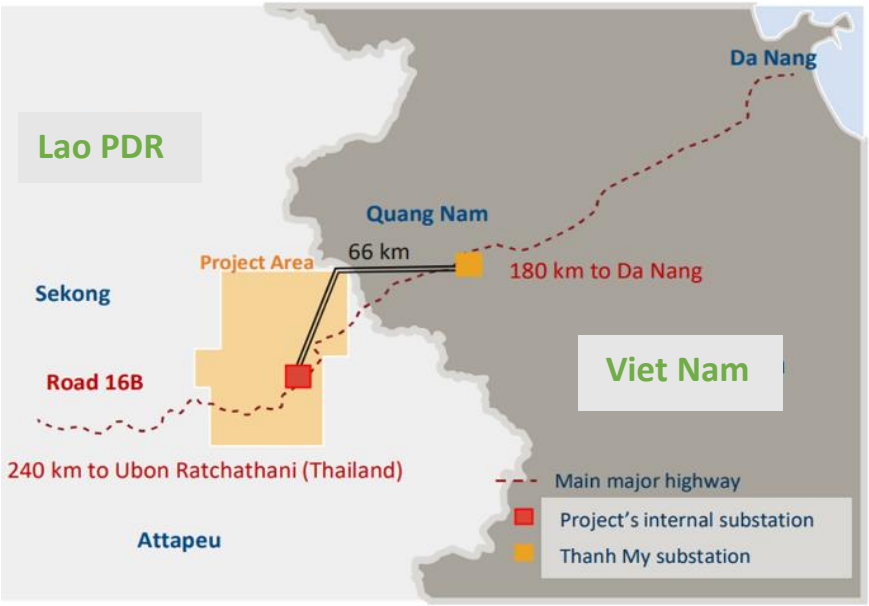
[13] INDE: Instituto Nacional de Electrificación (Guatemala); CEL: Comisión Ejecutiva Hidroeléctrica del Río Lampa and ETESAL: Empresa Transmisora (El Salvador); ENEE: Empresa Nacional de Energía Eléctrica (Honduras); ICE: Instituto Costarricense de Electricidad and CNFL: Compañía Nacional de Fuerza y Luz (Costa Rica); and ETESA: Empresa de Transmisión Eléctrica (Panama).

[14] ENEL (formerly ENDESA) of Spain, Interconexión Eléctrica S. A. (ISA) of Colombia, and Comisión Federal de Electricidad (CFE) of Mexico

5.2 Monsoon 600-Megawatt Cross-border Wind Power Project

SECTION A: Project Overview

- Sector: Energy project, renewable
- Countries or economies involved: Lao PDR and Viet Nam
- Stated objective (if any): increasing the electricity supply from renewables in Viet Nam by supporting a cross-border power trade between Lao PDR and Viet Nam; reducing Lao PDR's current dependence on hydropower for electricity generation and diversifying its source of electricity exports.
- Main components: a 600-megawatt wind power generation facility, a 500-kilovolt substation, and a 22-kilometer 500-kV transmission line
- (Estimated) Project cost: USD 946 million
- Financing arrangement: The project financing of USD 692.55 million is co-financed by ADB and AIIB as well as the financing from the other development financial institutions and commercial banks.
- Expected/Actual year of commercial operation: 2025.
- Project outcomes, impact, and other highlights: first cross-border wind power project in Asia; first wind power project in Lao PDR; the largest wind farm in Southeast Asia; Private capital mobilization: financing from commercial banks and sponsors' equity injection to the project company; ADB provides blended concessional finance to mitigate key project risks.
- Map(s) of the project:



Source: IEAD

Disclaimer: The map is for illustrative purpose, and it does not represent the endorsement by AIIB, EBRD, and IDB on any country borders.

SECTION B: Economic Rationale and Planning

- Positive and negative externalities:

  1. Positive externalities:

     Global public goods: Investment in renewable power generation and transmission to speed up GHG emission reduction while ensuring access to affordable, reliable, and more sustainable energy for more.

     Cross-country complementarity and regional public goods: Supporting a cross-border power trade to leverage Lao PDR's rich resources for wind power generation and to meet Viet Nam's rising energy demand. It will also reduce Lao PDR's current dependence on hydropower for electricity generation and diversify its source of electricity exports.

  2. Negative externalities:

     Environmental impacts: a moderate impact on the landscape values of the project site, reduction in habitat for supporting key globally and/or nationally threatened species.

     Social impacts: economic displacement of local households who are also key stakeholders, negative impacts on livelihoods.

- Distributional analysis:

  1. Viet Nam:

     Costs: the cost of building a 500kV transmission line from the project to the Thanh My Substation.

     Benefits: An increased supply of renewable energy at a lower price compared to the general market energy price. Support the country's Nationally Determined Contribution under the Paris Agreement to reduce greenhouse gas emissions.

  2. Lao PDR:

     Costs: the cost of building a 600-megawatt wind power generation facility, and a 500-kilovolt substation. Communities will face negative environmental and social externalities.

     Benefits: Revenues from royalties, corporate income taxes, and lease rent throughout the concession period. Potential creation of business opportunities and technical transfer during the construction and operation periods.

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment

  1. Between Lao PDR and private companies:

     An MOU between Impact Energy Asia Development Limited (IEAD) and Lao PDR to study the feasibility of large-scale wind projects in the country (2011); Project Development Agreement: granting IEAD exclusive rights to develop the first wind project in Lao PDR (2015); Concession Agreement between IEAD and the Government of Lao PDR (2022) to establish the project company, namely Monsoon Wind Company Ltd.

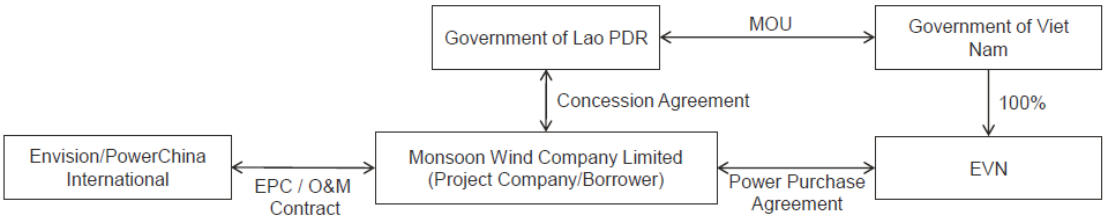
  2. Between Lao PDR and Viet Nam:

     An MOU between the Government of Lao PDR and the Government of Viet Nam for the supply of 5GW of renewable wind power (2016); The project was officially nominated by Lao PDR to the Ministry of Industry and Trade of Viet Nam under a collaboration in the

energy sector (2017); The Prime Minister of Viet Nam approved the plan for importing power generated from the project to Viet Nam's power system and the additional 500kV transmission line (2020); The 25-year Power Purchase Agreement with Viet Nam Electricity Group (EVN) (2021).

- State capacities, conflict resolution, and inter-government institutional arrangement

Figure 2: Institutional Arrangement



SECTION D: Finance and Management

- Funding sources and financial structure:

  The total project costs are estimated to be USD 946 million with a financing of USD 692.55 million. The project is co-financed by ADB and AIIB as well as the financing from the other development financial institutions and commercial banks. Key risks are 1. Technical: Delays in the development of Lao PDR and Viet Nam's transmission infrastructure as part of the project; 2. Commercial: Lower than forecasted demand, curtailment; 3. Political/policy: Political and policy uncertainties that are not covered in the MOU and PPA. MDB's Concessional blended finance to mitigate key commercial risk: Prior to launching syndication, ADB administered concessional financing of USD 50 million and a $10 million grant to fill a curtailment debt service reserve account that the borrower could use to partially mitigate repayment risk to senior lenders in case of extreme curtailment.

- The role of the public and private sector:

  MDB lending and Syndicated loan to bring in private capital: Siam Commercial Bank, Sumitomo Mitsui Banking Corporation; JICA, AIIB, Kasikorn, EXIM Bank of Thailand, etc.

5.3 Paraguay – Paraná Waterway

SECTION A: Project Overview

- Sector: Transport
- Countries or economies involved: Bolivia, Brazil, Paraguay, Argentina, Uruguay
- Stated objective (if any): Promoting regional integration, increasing trade opportunities, and reducing transportation costs. By enhancing navigability and infrastructure along the waterway, the project aims to unlock economic potential, stimulate investment, reduce climate change and ecosystems impact and foster cooperation among participating nations.
- Main components:

  2. Improvements in waterways (dredging and signaling)
  3. Operational Norms and Institutional Framework to promote waterways infrastructure investment in a concession contract, and
  4. International Agreements and Cooperation
  5. Implement natural based solutions to reduce climate change and ecosystem impact due to the project

- (Estimated) Project cost: Not reported. Waterway operation & maintenance under concession.
- Financing arrangement: Public funds and O&M financed by tolls; private ports.
- Expected/Actual year of commercial operation: 1995.
- Project outcomes, impact, and other highlights:

  Navigability**:** Infrastructure enhancements, dredging and signaling systems, have made Paraguay and Paraná rivers more navigable. This has led to smoother transportation of goods, boosting trade activity and regional economic growth.

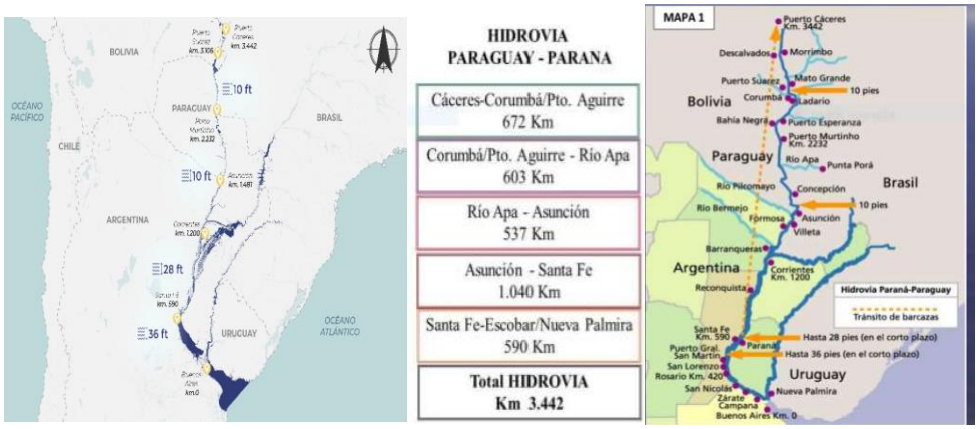
  Trade Expansion: Better waterway infrastructure has spurred trade expansion by offering more efficient transportation routes for goods. The tons transported went from 700.000 in 1988 to 17.4 million in 2010, exceeding 36 million in recent years.

  Institutional Framework: The project establishes institutional bodies like the Intergovernmental Committee of the Waterway (CIH) to facilitate coordination and cooperation among participating countries, ensuring effective management and oversight.

  Cost Reduction: (1) One barge can carry 1,600 tons of cargo, while 40 rail cars or 80 trucks would be required for the same load. (2) Transporting 1 ton of cargo, for each liter of diesel, 251 km are traveled by barge, 101 km by rail, or 29 km by truck. (3) As for freight, taking the unit as an index, the waterway mode pays 1, the rail mode, 1.4, and the road mode, 3

  Reduce climate change, and ecosystem impact in the area of influence and in the infrastructure of the project: The project establishes mitigation and adaptation measures to reduce the impact of climate change on infrastructure and areas of influence and also policies to reduce de impact of the project in the ecosystems.

- Map(s) of the project:



SECTION B: Economic Rationale and Planning

- Positive and negative externalities:

1. Positive externalities:

   Improved Connectivity: Enhanced navigability of waterways and ports facilitates the transportation of goods among participating countries, boosting regional trade and strengthening economic integration.

   Regional Cooperation: The integration process facilitated by the Waterway Project fosters cooperation among participating countries, strengthening diplomatic ties and promoting stability in the region.

   Logistical Cost Reduction: The efficiency of river transport helps to decrease logistical costs associated with trade, thereby enhancing companies' competitiveness, and stimulating economic activity in the region.

   Infrastructure Development: Investment in river infrastructure promotes the development of private ports and logistical infrastructure, generating employment opportunities and attracting investments that benefit local communities.

   Environmental Preservation: Preference for river transport over land transport contributes to the reduction of carbon emissions and traffic congestion, resulting in environmental benefits such as improved air quality and reduced carbon footprint.

   Socioeconomic Development: Enhanced River connectivity provides socioeconomic development opportunities for previously marginalized communities, enabling them to access services, employment, and education more effectively.

2. Negative externalities:

   Interstate Disputes and Coordination Challenges: Differences in national interests, priorities, and governance structures may hinder effective coordination and decision-making, potentially resulting in delays, inefficiencies, and conflicts.

   Environmental Degradation: Dredging and channelization for navigation can disrupt river ecosystems, leading to habitat loss, water pollution, and disturbance of aquatic life.

   Sedimentation and Erosion: Alterations to river flow and sediment transport can result in increased erosion in some areas and sedimentation in others, affecting river morphology and downstream ecosystems.

Water Scarcity: During dry seasons, heightened water extraction for navigation may worsen water scarcity concerns, potentially affecting downstream agricultural and domestic water requirements. (5) Invasive Species: Enhanced connectivity can enable the proliferation of invasive species, disrupting indigenous ecosystems and triggering ecological imbalances.

- **The distribution of costs, benefits, and impact between countries:** The distribution of costs and benefits reflects a series of complex dynamics. Argentina, as the main agricultural producer and exporter in the region, represents 83% of the total volume of cargo moved by the waterway, which implies a significant contribution to traffic and a considerable proportion of the economic benefits generated by the project. This increase in the transportation of agricultural products is directly related to the growth in the transportation of agricultural inputs. In contrast, other countries such as Bolivia and Paraguay also benefit from improved access to international markets through the Waterway. Data from the Bolivian Institute of Foreign Trade (IBCE) consider the Waterway as the natural route for overseas cargo from the Santa Cruz de la Sierra region and indicate that 50% of the 3.5 million tons that currently exit through Chilean Pacific ports could do so through HPP if the necessary investments were made. However, it is expected that the investments needed to improve infrastructure can increase the participation of these countries in river transport, which could balance the distribution of benefits in the long term. In addition, the Waterway also benefits Brazil, which has a stake in the region's agricultural production and exports and can use the waterway to export iron ores.

SECTION C: Political Support and Governance

- **Policy, legal, and regulatory alignment**

  The agreements regarding the Paraguay-Paraná Waterway have strengthened regional cooperation and integrated management of this important transportation route. Among these agreements, the "Fluvial Transport Agreement for the Paraguay-Paraná Waterway" stands out, signed in June 1992 by Argentina, Bolivia, Brazil, Paraguay and Uruguay, during the event known as the "Santa Cruz de la Sierra Agreement." This agreement designates the Intergovernmental Waterway Committee (CIH) as its political body and creates the Agreement Commission to monitor compliance and propose necessary measures. Furthermore, it establishes that modifications or additions to the agreement be formalized through Additional or Modifying Protocols, thus promoting the flexibility and adaptability of the legal framework. Article 2 of the agreement clearly defines the geographical scope of the Waterway, including the Paraguay and Paraná rivers, as well as the Tamengo Canal, which helps harmonize the legal and regulatory frameworks between the countries. These agreements reflect solid high-level political support and a shared commitment towards regional cooperation and the sustainable development of the Paraguay-Paraná Waterway.

- **State capacities, conflict resolution, and inter-government institutional arrangement**

  The institutional agreement for the Paraguay-Paraná Waterway, although established with the intention of fostering regional integration and cooperation, reflects some unbalanced capabilities between the countries. While the framework provides a platform for collaboration, there are disparities in terms of financial resources, technical expertise and administrative capabilities between participating nations. Furthermore, while conflict resolution mechanisms exist, disparities in state capabilities can influence the effectiveness of these mechanisms. Despite these challenges, the institutional framework, including the CIH and agreements such as the "Paraguay-Paraná Waterway River Transport Agreement", serves as a platform for dialogue and cooperation between the countries.

SECTION D: Finance and Management

- **Funding sources and financial structure:**

Over the years, various sources of financing have been explored, both internationally and regionally. Financial organizations such as the Inter-American Development Bank (IDB), the Financial Fund for the Development of the La Plata Basin (FONPLATA), the Andean Development Corporation (CAF), the United Nations Development Program (UNDP) and the Commission of the European Communities have been considered as potential collaborators to finance studies, projects and works. Several technical cooperation agreements have been signed with the objective of carrying out feasibility studies, financing projects and promoting the development of the Waterway.

The Executive Secretariat of the Intergovernmental Waterway Committee has played a crucial role in the management and coordination of these financing initiatives. However, over the years, there have not been a regional financial structure to fund the maintenance and operation of the waterway. The lack of continuity in Committee meetings and changes in funding dynamics have contributed to the loss of momentum in some projects and delays in the implementation of others. There are challenges in homogenizing multiple regulatory aspects, such as issues related to training and qualification of on-board personnel, tax and tariffs on shipping activities, import of inputs and final goods, among others. There is no coordination in the identification of necessary interventions in each section of the Waterway, the financing mechanisms for the works and their maintenance (i.e. tolls), among many other aspects.

Individually, countries have funded improvement interventions. The concession of the so-called Trunk Navigable Route (VNT) from Santa Fe to the Ocean - later extended to Confluencia – was promoted by the Argentine State in 1995. The concession began in 1995 for 10 years for the Santa Fe-Océano section, contemplating dredging and maintenance works, and signaling, and toll payment. In 2004 a renegotiation occurred that added the Santa Fe section to Confluencia. This renegotiation extended the term for an additional 15 years, to which 2 years were later added. While a new concession is launched, Argentine public company AGP S.E is responsible for the maintenance of navigation conditions. Another section operated under a toll concession regime - started in 2018 for a period of five years - is the Martín García Canal (in the Río de la Plata); The grantor in this case is the Administrative Commission of the Río de la Plata, a binational entity between Argentina and Uruguay. The rest of the navigable waterway is not operated under concession and is the subject of sporadic interventions.

- **The role of the public and private sector:**

  The Paraguay-Paraná Waterway project has implemented various strategies to ensure its financial viability. Firstly, work has been done on the bankability of the project, developing feasibility studies, evaluating risks and returns, and establishing a regulatory framework to attract private investors. In addition, it has received public support in the form of grants, subsidies, concessional loans or guarantees, from both national and international organizations interested in regional integration and economic development. Given its multinational nature, the project involves the participation of multiple stakeholders, including governments, international financial organizations, private companies, civil society organizations and local communities, which requires effective coordination between them. Additionally, financing options such as concessional loans and guarantees have been explored to mitigate risks, with the possible participation of multilateral financial institutions such as the IDB or CAF, as well as national government agencies.

5.4 Middle Corridor (MC)

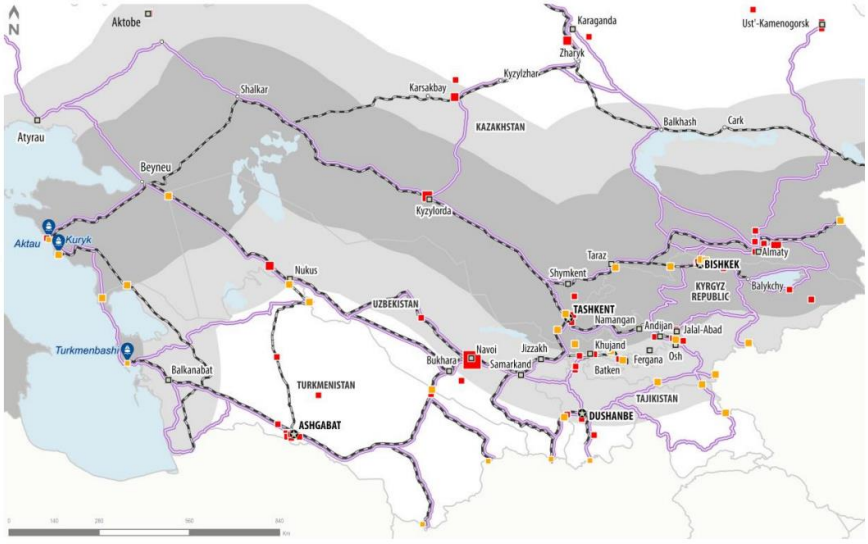
SECTION A: Project Overview

- Sector: Transport
- Countries or economies involved: Central Asian countries (Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan)
- Stated objective: Develop the Central Asian section of the Middle Corridor to improve transport connectivity and operational efficiency through the construction and rehabilitation of infrastructure and enhanced soft connectivity.
- Main components:

  1. Development of the main transport network of MC and regional connections

  2. Design of institutional, legal, and regulatory improvements for regional and international alignment

- (Estimated) Project cost: EUR 18.5 billion
- Financing arrangement: Mostly sovereign in the near term, with higher private sector participation in financing, construction, and management in the medium- to long-term once market reforms are implemented properly.
- Expected/Actual year of commercial operation: Technically, the Middle Corridor is already operational; however, its throughput and operational efficiency are currently low.
- Project outcomes, impact, and other highlights: 1. Enhanced capacity along the Central Asian segments of the MC, 2. Improved operational efficiency, 3. Regulations and legislations towards commercialization and liberalization, 4. Increased private sector participation, 5. Environmental benefits through modal shift, 6. Higher regional inclusion in Central Asia through the development of regional connections to the main network
- Map(s) of the project: The most sustainable transport connections between Europe and Central Asia[15]



Source: EBRD and CPCS.

[15] Country maps showing location of proposed projects can be found on: Sustainable transport connections between Europe and Central Asia (ebrd.com)

SECTION B: Economic Rationale and Planning

- Positive and negative externalities:
  1. Positive externalities:

     Stronger regional coordination through a single corridor manager and development of unified tariffs and procedures.

     Increased economic connectivity between Central Asian economic centers through regional and international value chain integration and enhanced economic opportunities.

     Improved border crossing practices, driven by lower transaction costs and times, and user-friendly procedures.

     Enhanced long-term planning through improved project prioritization and coordinated implementation.

     Better environmental outcomes through climate change mitigation and adaptation measures.

  2. Negative externalities:

     Differing levels of economic benefits for the implementing countries given the difficulties in developing 'fair value sharing' arrangements.

     Higher GHG emissions and pollution due to induced traffic in regions where railway connections are not available, as initial capacity improvements mainly relate to road networks.

- Distributional analysis:
  1. Kazakhstan

     Costs: EUR 5.5 billion

     Benefits: Improved multimodality, increased fleet size for all modes of transportation, better port efficiency, and enhanced border crossing practices.

  2. Kyrgyz Republic

     Costs: EUR 6.4 billion

     Benefits: Improved railway network, better service provision, enhanced multimodality.

  3. Tajikistan

     Costs: EUR 229 million

     Benefits: Improved railway network, better integration with key economic centers, enhanced border crossings.

  4. Turkmenistan

     Costs: EUR 935 million

     Benefits: Improved cross border linkages with neighboring countries.

  5. Uzbekistan

     Costs: EUR 5.4 billion

     Benefits: Increased capacity on railways, enhanced private sector participation in network expansion, improved multimodality.

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment

  Buy-in at highest level in all Central Asian countries demonstrated by Heads of State in multiple international fora. However, alignment of legal and regulatory frameworks remains limited in the region, and convergence to international best practices would support further regional and international integration.

- State capacities, conflict resolution, and inter-government institutional arrangement

  Project prioritization, design and implementation capacities are higher in Kazakhstan and Uzbekistan; however, support is needed in Kyrgyz Republic and Tajikistan to improve their practices and the readiness of projects. Moreover, fiscal space is limited in the latter two countries, increasing the importance of utilizing better practices for successful project selection and implementation.

SECTION D: Finance and Management

- Funding sources and financial structure:

  Mostly sovereign in the short-term, with higher private funding expected in medium- to long-term subject to implementation of market reforms towards commercialization and liberalization.

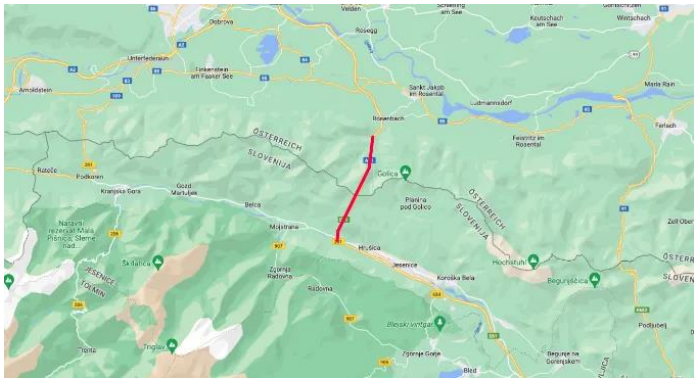
- The role of the public and private sector:

  In all Central Asian countries, scope of bankable projects remains limited to sovereign funding as the primary option for the completion of highest priority near-term projects. However, there are some niche areas where private sector participation is currently possible and these mostly relate to logistics services and fleet expansion. In Kyrgyz Republic and Tajikistan, given the limited fiscal capacity, grants and concessional loans would also facilitate project implementation.

5.5 Karawanke Tunnel (8km) between Austria and Slovenia

SECTION A: Project Overview

- Sector: Transport
- Countries or economies involved: Austria and Slovenia
- Stated objective (if any): Elimination of a bottleneck on the Trans European Road Network and the mandatory safety upgrade requirement in accordance with the EC Directive 2004/54/EC on minimum safety requirements for tunnels in the Trans European Road Network.
- Main components: The refurbishment of the existing tube and construction of a second tube including the establishment of a transverse ventilation system and appropriate emergency facilities - including escape tunnels required by the Directive.
- (Estimated) Project cost: EUR 400 million
- Financing arrangement: Each state is responsible for the cost of the project on its own territory.
- Expected/Actual year of commercial operation: 2025 (expected)
- Project outcomes, impact, and other highlights: Improved user safety and additional capacity.
- Map(s) of the project:



Source : https://mautgebuhren.de/maut-karawankentunnel/

SECTION B: Economic Rationale and Planning

- Positive and negative externalities:

1. Positive externalities:

   The tunnel lies on the comprehensive TEN-T network and connects two core network corridors, the Baltic – Adriatic and the Mediterranean corridor. It connects the hubs of the comprehensive and core transport network (Villach – Klagenfurt, Ljubljana). The project will provide improved user safety as well as improved connectivity. Local and global emissions are expected to be reduced modestly due to the reduction of congestion arising from the additional capacity.

2. Negative externalities:

   The main potential negative impacts will be localized, temporary and related to construction activities, in particular noise, vibration, transport and disposal of waste and risk of contamination of underground water. These risks will be mitigated by good construction

practices, enforced on the contractors performing the works through third party qualified supervision. Once completed the project will have minor negative residual impacts, relating mainly to permanent conversion of a small additional amount of land for the portal and disposal areas.

As a cross-border project, the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo convention) is applicable. In 2016, the necessary cross border consultations between Austria and Slovenia were completed and an agreement reached on monitoring the status of underground water and data exchange.

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment

  The project supports the completion of the EU's Trans European Road Network. The aim of the TEN-T is to provide efficient connectivity between EU member states to facilitate the development of the single market. Both states are subject to EU Directives and their own national law.

- State capacities, conflict resolution, and inter-government institutional arrangement

  The cooperation on the project is based on a high-level interstate treaty concluded between Austria and Slovenia (then SFR Yugoslavia) in 1978. Among other provisions, this covered the legal relationships and the division of financing between the states. The treaty was passed into law by both states. The relevant authorities in Austria and Slovenia signed a project specific Memorandum of Understanding defining the respective scope of works for each party on their own territory.
  Pursuant to the treaty, the two highway agencies established a joint Construction Committee before starting construction work. The committee is composed equally by representatives of both agencies. This joint construction committee takes responsibility for the coordination of the construction process, including the necessary planning phases and the official procedures that must be complied with in Austria and Slovenia.

SECTION D: Finance and Management

- Funding sources and financial structure: The tunnel is subject to a toll which is shared between the two countries' highway agencies. The highway agencies are responsible for the financing of the project on their territories. The financing comprises a mix of own funds, EIB and commercial bank loans.
- The role of the public and private sector: The project is implemented and operated by two promoters (and borrowers), which are the respective Slovenian and Austrian highway agencies. The project also benefitted from Connecting Europe Facility (CEF) grants for preparatory studies and construction work on both sides, totaling EUR 25 million.

5.6 Rail Joint Border Crossing Station at the North Macedonian-Serbian border (Rail Corridor X)

SECTION A: Project Overview

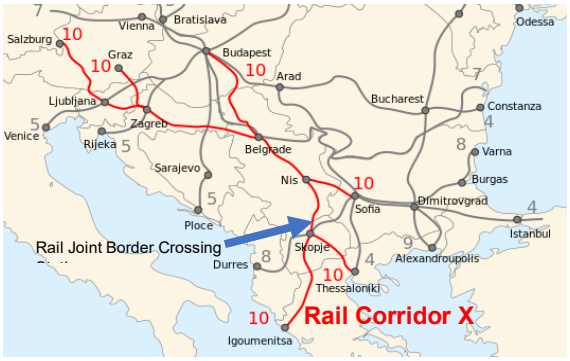
- Sector: Transport
- Countries or economies involved: North Macedonia and Serbia (Rail Corridor X includes Austria, Bulgaria, Croatia, Greece, Hungary, North Macedonia, Serbia, and Slovenia)
- Stated objective (if any): Reduce border crossing times at the rail border crossing between the two countries and consolidate border-crossing procedures, facilitating transportation of both freight and passengers.
- Main components: Optimize border-crossing procedures through a "one-stop" crossing; enable energy efficiency upgrade of the existing rail station buildings; and construct additional new high energy performance buildings including associated equipment including joint border building, passenger station, building for railway companies from Serbia, power supply building for station, wastewater treatment station and water supply building.

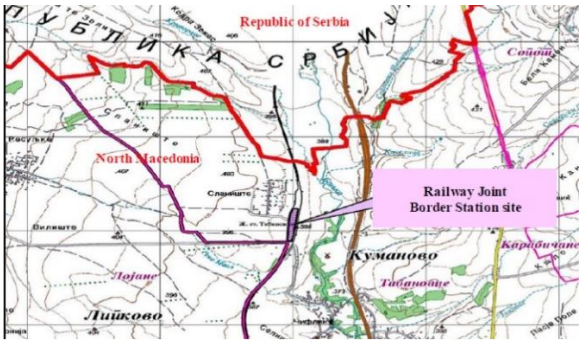
  The rail joint border crossing station is located on Rail Corridor X, one of the key Pan European rail corridors connecting Central Europe with Southeast Europe. It is part of the Trans-European Transport Network ("TEN-T") and the backbone of the Southeast Europe Core Network, which includes the most important connections linking major cities and nodes. The development of this Core Network is promoted by all the countries of the region given its importance for promoting regional trade, economic growth, and connectivity with the European Union. Rail Corridor X is the main north-south route running through North Macedonia and at a larger scale through the Western Balkans region. In North Macedonia, Rail Corridor X is the only corridor that connects the country with its neighbors, Serbia and Greece, and where passenger/freight transport is ongoing.
- (Estimated) Project cost: EUR 7.4 million (The joint border crossing station is one of nine projects proposed under Rail Corridor X in Serbia with the total estimated investment of EUR 1.1 billion).
- Financing arrangement: EBRD sovereign loan of EUR 5 million, WBIF (Western Balkans Investment Fund) capex grant EUR 2.4 million. (Rail Corridor X will be financed through a mix of grants, loans, and national contributions.)
- Expected/Actual year of commercial operation: 2027
- Project outcomes, impact, and other highlights:

  Reduce border wait times (50% for passengers and 30% for freight transport) and shorten border-crossing procedures, thus improve regional integration and connectivity.

  Enable official staff and railway personnel from both countries to work at the same site, optimizing the procedures of border and custom controls leading to more effective, and quicker operations between the different stakeholders involved in the station (police, customs, inspection authorities, train operators and railway infrastructure companies).

  Promote green transition with the implementation of energy efficiency measures. The new buildings will be constructed according to higher energetic requirements (EPC of class B instead of the national minimum requirement for North Macedonia which is class C).
- Map(s) of the project: Rail Corridor X (left hand side), Rail Joint Border Crossing site location (right hand side)





SECTION B: Economic Rationale and Planning

- Positive and negative externalities:

  1. Positive externalities:

  Facilitation of transport from Central Europe to Southeast Europe, promoting regional trade and economic growth (70% of freight transport in North Macedonia uses the Tabanovce border crossing), and connections to the European Union, while enabling time savings and efficiency gains.

  Transition to low carbon pathway and mitigation of carbon transition risks through energy efficiency measures, resulting in expected lowered carbon emissions (annual reduction of 363 tCO2).

  An economic (cost-benefit) analysis was carried out for the Project taking into consideration the following drivers of economic benefits: (i) travel time savings; (ii) utility cost and wastewater treatment savings, (iii) emission savings and (iv) savings in vehicle operating costs. When considering the economic impacts on operational costs, travel time and externalities, the resulting EIRR is at 30%, NPV of EUR 27 million and cost benefit ratio of 5.7 confirming the strong economic rationale of the Project itself.

  2. Negative externalities:

  Negative externalities are mainly related to environmental and social impacts of the Project and are mitigated by the development of an environmental and social action plan to be implemented by the client as well as development of a contractor environmental and social management plan.

- Distributional analysis:

  1. North Macedonia: Costs: 100% EUR 7.4 million, Benefits: 50%

  2. Serbia: Costs: 0% (rent for using the facilities to be decided at a later stage) Benefits: 50%

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment

  It is located on Corridor X, one of the key Pan-European rail corridors, facilitating transport from Central Europe to Southeast Europe and part of the Trans-European Transport Network (TEN-T), with a particular importance for the promotion of regional trade, economic growth, and connections to the European Union. The construction of the rail joint cross border station

is also part of the European Commission's Connectivity Agenda. The project complies with the requirements of the soft measures for the creation of joint railway border crossing stations in countries in the Western Balkans to facilitate railway transportation.

The Project is one of the key priority investments included in the North Macedonia National Transport Strategy (2018-2030) and is part of the Transport Community Action Plan for the country.

- State capacities, conflict resolution, and inter-government institutional arrangement.

  To address the decisions of the EU Connectivity Agenda, agreed on at the Vienna Western Balkans 6 Summit, an agreement on establishment of border procedures for the railway border crossing Tabanovce – Presevo was signed on 16 February 2015 between the Minister of Transport and Communications and the Minister of Construction, Transport and Infrastructure of the two countries, respectively. Although the Project's costs will be fully covered by the Republic of North Macedonia, the benefits will be the same for economic operators and individuals in both Serbia and North Macedonia.

  The Project requires close cooperation between the authorities of both countries to ensure smooth operation of the joint rail border crossing station. This means political will from both countries was required from the outset. The nature of the Project also required an agreement between the two countries to be signed to obtain the financing and make the necessary project implementation and operation arrangements both on Macedonian and Serbian territories with implementation responsibility of the Macedonian institutions, raising implementation risks. In addition, coordination and cooperation among several stakeholders such as police, customs, inspections were challenging.

SECTION D: Finance and Management

- Funding sources and financial structure:

  The EBRD's financing was designed as a sovereign loan to the Republic of North Macedonia represented by its Ministry of Finance with an investment grant co-financing from WBIF.

- The role of the public and private sector:

  No subsequent private investment was envisaged under this project.

5.7 Integral Sanitation Program for the Cities of the Uruguay River Basin – Entre Ríos Province

SECTION A: Project Overview

- Sector: Water and Sanitation
- Countries or economies involved: Argentina, Brazil and Uruguay
- Stated objective:

  To support investments with specific positive impacts in improving water quality as a measure for water security and bolstering basin-wide efforts for transboundary water management by enhancing technical and institutional capacities for cross-border water management, cooperation and investment planning.

  The Integral Sanitation Program for the Cities of the Uruguay River Basin – Entre Ríos Province (RG-L1131[16]) aims at improving sanitation on the banks of the Uruguay River while addressing the challenges for transboundary water management. The specific objectives are to: (i) expand coverage of sewer and wastewater treatment services and (ii) improve service management capacity.

Figure 1. Location of the province of Entre Ríos (Argentina) and main cities involved in the program.

- Main components: C1: Infrastructure works; C2: Improved management of services and project preparation and C3: Program management.
- (Estimated) Project cost: US$80 M.
- Financing arrangement: Public.
- Expected/Actual year of commercial operation: Tentative 2025.

[16] https://www.iadb.org/en/whats-our-impact/RG-L1131

- Project outcomes, impact, and other highlights: The main beneficiaries are the inhabitants of the cities of the Uruguay River coast at the Argentinian side, as a result of the sewer and wastewater treatment systems are being expanded for an estimated 390,000 inhabitants; however, the program's main benefit relates to an improvement in urban environmental quality, especially in terms of the sanitary conditions on the stretch of the Uruguay River shared by Argentina and Uruguay.

Outcome indicator	Unit of measure	Baseline	Target
Effective flow rate of treated wastewater	m^3/sec	0.22	1.27
Amount of organic matter removed from discharges into the Uruguay River	BOD (ton/year)	1,388	8,010
Households with improved sewer service in program intervention cities	Households	40,492	97,725
Households whose sewage effluents are treated in the program's intervention cities	Households	24,117	97,725
Operators incorporating gender equity approach in their practices and policies	Operator	0	2

SECTION B. Economic Rationale and Planning

- **Positive and negative externalities assessment**:

  Drivers: the river's pollution stemming from the discharge of untreated wastewater affecting Uruguay and Argentina

  Challenges: Financial constraints to cover operation and maintenance costs, investments needed, and modernization of the management and governance processes. Need to increase coverage, quality of the sewer service, and, in particular, wastewater treatment.

- **Distributional analysis**:

  Costs: US$80M covered by AR for: Rehabilitation, optimization, and expansion of collection systems and Improved management of services

  Benefits: (i) removal of more than 6,600 tons/year of organic matter from the wastewater discharged into the river. (ii) improve the operational and management capacities of the service operators. (iii) local economic development opportunities (alternatives for the management and sustainable use of stabilized sludge from treatment plants). (iv) Improvement of the governance at the basin level, including cross-border planning and management

- **Role of MDBs**: Continuous support from the IDB team to the executing agency includes providing technical monitoring and operational planning support. Additionally, capacity building through training sessions and workshops associated with the operations is facilitated by the IDB.

SECTION C: Political Support and Governance

Governance- Institutional Integration Framework: Specifically, to coordinate actions for preserving and restoring water quality in the shared stretch of the Uruguay River, a joint administration called the Uruguay River Administrative Commission (CARU) [17] was established. Formed by the Statute of the Uruguay River, it serves as an institutional mechanism for the optimal and rational utilization of the river. As one of the most important strategies within the framework of the Statute, CARU identified the need to implement a

[17] The CARU is made up of delegates from Argentina and Uruguay

sanitation plan for the Uruguay River to mitigate the negative environmental impacts generated by discharges from riverside cities due to the lack of, or deficient, sewer systems and wastewater treatment.

Within the Argentine Republic, the leadership in advancing the necessary actions to sanitize the river has come from the province of Entre Ríos (PER). With technical support from the Salto Grande Special Fund Administration Commission (CAFESG) and the municipalities of Concordia, Gualeguaychú, Concepción del Uruguay, Colón, and San José, sanitation projects are being developed in each of these cities. It is expected that investments for these projects will be financed by this program.

The Republic of Uruguay has also made progress in this area under the leadership of the State Sanitation Works (OSE), a public Uruguayan company responsible for water and sanitation services (WSS) in most of the territory. OSE has defined an investment plan encompassing the main population centers on their side of the river. This program financed the sanitation actions identified on the Argentine side, fulfilling the binational integration agreements, complementing the actions already being financed by OSE with their own resources on the Uruguayan side.

- Policy, legal, and regulatory alignment:
  - Framework of the Sustainable Entre Ríos program carried out by the Secretariat of the Environment of the Government of Entre Ríos
  - National Drinking Water and Sanitation Plan (2016)
  - Entre Ríos Sanitation Infrastructure Plan (AR)
- State capacities and inter-government institutional arrangement:

  Governance structure and Institutions setup:
  - Secretariat of Water Infrastructure and Policy (UR)
  - Secretariat of Public Works and Services (AR)
  - Conformation of binational and trinational watershed management bodies (joint commission Uruguay River Administrative Commission -CARU)
  - Binational water-related regional integration strategies
- Role of MDBs:

  Support to external institutions:
  - Technical support in AR: Administrative Commission for the Salto Grande Special Fund (CAFESG)
  - Financing: AR (IDB). UR (Obras Sanitarias del Estado (OSE), Uruguay's state-owned enterprise)

SECTION D: Finance and Management

- Funding sources and financial structure:

  Financial structure design: investments agreed on the "Sanitation plan for the Uruguay River" are financed by:
  - On the Uruguayan side: Obras Sanitarias del Estado (a state-owned enterprise)
  - On the Argentinian side: the IDB, through a US$80M investment loan.

Risks identified and mitigated: (i) potential delays in program execution and difficulty in supervising O&M contracts due to lack of experience, macroeconomic variations leading to economic and financial imbalances, changes of municipal authorities, and others. (ii) shortcomings in the projects could lead to increased costs during the execution of works.

5.8 China-Lao PDR: Mohan to Vientiane Railway

SECTION A: Project Overview

- Sector: Transportation
- Countries or economies involved: China, Lao PDR
- Stated objective (if any): Achieve Lao PDR' strategic goal of transforming from a landlocked country to a land-linked nation, which is a significant flagship project jointly promoted by China and Lao PDR.
- Main components:
  1. Project Design, Construction, Financing, Operation, and Maintenance: Lao PDR–China Railway Company Limited
  2. Mowan Railway Co., Ltd. accounting for 40%, Beijing Yukun Investment Co., Ltd. (CIC) accounting for 20%, Yunnan Provincial Investment Holdings Group Co., Ltd. accounting for 10%, Lao PDR National Railway Co., Ltd. accounting for 30%.
  3. Lender (financing loans): Export-Import Bank of China
- (Estimated) Project cost:

  The Mohan-to-Vientiane Railway project was approved for construction by the governments of China and Lao PDR, with Lao PDR–China Railway Company Limited as the project owner. The total investment for the project is RMB 37.425 billion, with capital funds amounting to approximately RMB 15 billion, accounting for 40% of the total investment. The Export-Import Bank of China provides financing loans of about RMB 22.4 billion, making up 60% of the total investment.
- Financing arrangements:

  The capital funds for this project are contributed by the shareholders of the project company in cash. The Lao shareholder, Lao National Railway Company, sources its capital funds from the Lao fiscal budget and a special loan from the Export-Import Bank of China. This involves annual budget allocations from the Lao Ministry of Finance over the five-year construction period, with the Export-Import Bank of China providing a special loan with a 25-year term (including a five-year grace period). The project debt financing is provided by the Export-Import Bank of China through a RMB loan with a 32-year term (including a 12-year grace period).
- Expected/Actual year of commercial operation:

  The project is constructed according to China's Class I railway standards, with a speed of 160 km/h, single track, mixed passenger and freight traffic, and electrification construction. The construction period is five years, with a 50-year concession operation period. Upon completion, the China-Lao PDR Railway will connect at its northern end to the domestic Yuxi-Mohan Railway and at its southern end to the Bangkok-Nong Khai segment of the China-Thailand Railway, forming an international railway corridor connecting China, Lao PDR, and Thailand. The China-Lao PDR Railway includes 75 tunnels, 166 bridges, 32 stations, 594 culverts, and 86.507 km track for station lines. The project officially commenced on January 1, 2017, and was completed and opened to traffic on December 2, 2021.
- Project outcomes, impact, and other highlights：

1. Continuous Investment and Preparation by Enterprises to Facilitate Project Implementation

   From April 2010 until the full commencement of the project at the end of 2016, China Railway Group Limited played a crucial role as one of the project initiators. Over nearly seven years, China Railway conducted on-site inspections, route planning, surveying and designing, financing planning, feasibility studies, logistics research, construction preparations, and personnel training. These efforts, along with continuous refinement of technical and financial plans, laid a solid foundation for the successful implementation of the project.

2. Facilitating Talent Development, Laying a Solid Foundation for Project Operation

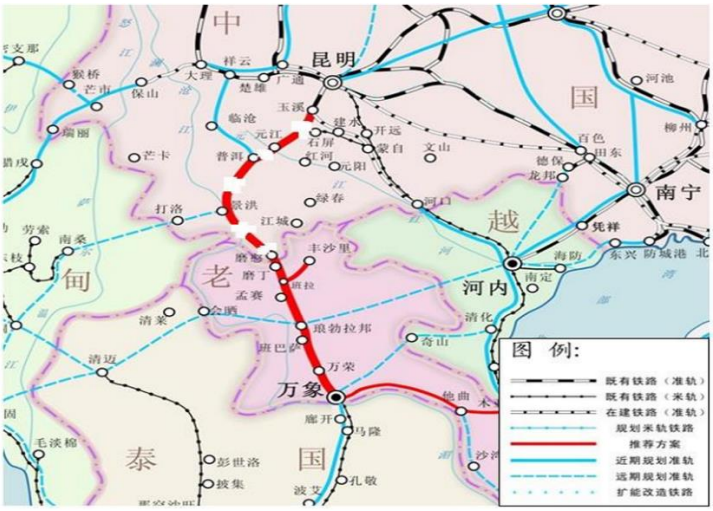
   In April 2019, the "Lao PDR Railway Vocational and Technical College" project was initiated. In July 2021, Kunming Railway Vocational and Technical College undertook part of the education capacity building and educational technology cooperation, assisting Lao PDR in establishing and developing mature railway technical talent training and training capabilities over a period of 7 years.

   In March and July 2022, 40 Lao students, arrived in Kunming, China, in two groups by Lao PDR–China Railway express trains, to undergo planned "Chinese language + vocational skills" professional railway training. In October 2023, the Lao PDR Railway Vocational and Technical College project was officially handed over to the Lao side.

3. Chinese Ecological Standards, Promoting Green Development

   In one section at the northernmost end of the Lao PDR section of the China-Lao PDR Railway, China Railway Fifth Group combined the design with the local conditions of Lao PDR. They selected local plants such as Lagerstroemia speciosa and Catharanthus roseus for greening construction on both sides of the embankment, not only constructing the railway but also making the surroundings highly ornamental. During the transplantation of green plants, a team called the "Red Gardeners" composed of female staff from the project department was formed. The company also developed "Auxiliary Tools and Devices for Embankment Slope Greening Construction," for which a national patent was applied.

- Map(s) of the project:



Route and Location Map of the New China-Lao PDR Railway

SECTION B: Economic Rationale and Planning

- Positive and Negative Externalities

1. Positive Externalities

1.1. Enhanced Passenger Travel Experience

The Lao PDR section of the China-Lao PDR Railway, serviced by the "Lancang" train, is known for its safety, eco-friendliness, convenience, and comfort. The travel time from Vientiane to Mohan on the China-Lao PDR border is significantly reduced from nearly two days by road to just three and a half hours by train. This transformation shortens the spatial distance between cities and changes Lao PDR' status as a landlocked country, making it a preferred mode of travel for local people. Currently, there are eight high-speed trains, and two regular passenger trains every day, greatly increasing passenger capacity and providing more travel options and convenience for residents along the route.

1.2. Establishment of an Efficient Logistics Corridor

The China-Lao PDR Railway creates a fast and efficient logistics corridor between China and ASEAN countries, significantly reducing transportation time and logistics costs, and establishing a vital international logistics route. The railway connects with the Yuxi-Mohan section in China to the north and the Bangkok-Nong Khai Railway in Thailand to the south, forming the China-Lao PDR-Thailand International Railway Corridor. This connectivity lowers the cost of exporting goods from ASEAN to China and facilitates large-scale exports of Southeast Asian agricultural and specialty products to Southwest China. To date, over 20 provinces in China have launched cross-border freight trains on the China-Lao PDR Railway, covering more than 10 countries and regions including Lao PDR, Thailand, Myanmar, Malaysia, Cambodia, and Singapore. The range of goods transported has expanded from over 100 types including initial items like fertilizers and rubber to over 2,000 types including electronics, photovoltaics, communications equipment, automobiles, fruits, vegetables, and flowers.

1.3. Promoting Economic Development in Lao PDR

The completion and operation of the China-Lao PDR Railway significantly improve transportation conditions in Lao PDR, facilitating the movement of goods and people, and enhancing the country’s basic transportation infrastructure. This development supports multiple aspects of Lao PDR' economic growth. The railway attracts a large number of tourists to Lao PDR, becoming the primary choice of transportation for visitors and creating new opportunities for the tourism industry. Additionally, the flow of people, resources, and information due to the railway fosters the establishment of related industrial clusters and stimulates rapid regional industrial economic growth, thereby boosting the overall economic development of Lao PDR.

1.4. Increasing Local Employment in Lao PDR

During the construction of the China-Lao PDR Railway, over 110,000 local jobs were created. In the initial phase of railway operations, more than 1,000 Laotian employees were hired. Future development of railway station areas, logistics parks, and new industrial cities along the route will create numerous employment opportunities for local residents, increasing their income.

2. Negative Externalities

During the railway construction, the construction section was temporarily affected. These impacts included potential disruption to local traffic, noise generation, waste generation,

and risks of air, soil, surface water and groundwater pollution. The project implementer has extensive experience and a comprehensive regulatory framework in place for waste transportation and disposal as well as pollution risk management. These negative impacts have been adequately mitigated and resolved upon the completion of the construction phase.

- Distribution Analysis:

  1. China

     Cost: Invested capital of RMB 10.5 billion

     Revenue: N/A

  2. Lao PDR

     Cost: Invested capital of RMB 4.5 billion

     Revenue: N/A

     Export-Import Bank of China

     Cost: Provided financing loans of approximately RMB 22.4 billion

     Revenue: N/A

Section C: Political Support and Governance

- Policy, legal, and regulatory alignment

  1. On April 7, 2010, China and Lao PDR signed the "Memorandum of Understanding on Railway Cooperation."
  2. On November 13, 2015, China and Lao PDR signed the "Intergovernmental Agreement on Railway Cooperation."
  3. On November 30, 2021, China and Lao PDR signed the "Agreement between the Government of the People's Republic of China and the Government of the Lao People's Democratic Republic on the Border Railway."
  4. With the support by the governments of both countries, China and Lao PDR each established a China-Lao PDR Railway Project Construction Coordination Working Group at the government level. The working groups operated jointly, conducting on-site surveys, project feasibility studies, financing preparations, and planning for bidding. The working groups consisted of subgroups focusing on business, finance, engineering and technology, and comprehensive issues. The initial discussions covered four main areas: research on Laotian laws and regulations, investigation of Laotian mineral resources, technical assessments of the project, and studies on investment plans.

- State capacities, conflict resolution, and inter-government institutional arrangement

  1. Chinese Leadership in Railway Investment and Management

     The China-Lao PDR Railway is the first overseas railway project where China leads in investment, construction, operation, and direct connection to the Chinese railway network. The entire railway employs Chinese railway standards, technology, and equipment, and follows the Chinese railway construction and operation management model. Chinese railway enterprises are responsible for the railway's construction and operation, with project financing primarily sourced from Chinese companies and banks. This ensures three key aspects:

     1.1. Funds for railway construction are raised according to plan.

1.2. Key project milestones, such as safety, quality, progress, and environmental protection, are met in control during construction.

1.3. The railway is efficiently operational post-construction.

2. Enhanced Communication and Efficiency

Building the railway has promoted policy communication between China and Lao PDR. The project has also led to the creation or revision of various regulations related to railway construction, railway management, public-private partnerships (PPP), logistics, and tourism in Lao PDR, filling many regulatory gaps. The railway construction is expected to transform transportation perceptions and market-oriented thinking among the Lao people.

3. Unconventional Solutions and Special Measures

Achieving breakthroughs in the project required unconventional solutions and special measures. The coordination group repeatedly reviewed and refined the financing plan, engaging with government departments of both countries and maintaining continuous communication with Chinese financial institutions. After five years, the financing difficulties were resolved: the Lao government secured special startup loans from China with its sovereign guarantees and additional collateral, adjusted the project equity ratio to 40%, and the Export-Import Bank of China provided long-term low-interest loans for project financing. This solution ensures that Lao PDR does not become overly indebted and prevents financing difficulties from halting the project.

Section D: Finance and Management

- **Funding sources and financial structure:**

The China-Lao PDR Railway project is structured as a joint venture between Chinese and Lao enterprises, forming a Special Purpose Vehicle (SPV) - Lao PDR–China Railway Company Limited. This entity is responsible for the design, construction, financing, operation, and maintenance of the railway. The equity capital is provided by Chinese and Lao enterprises in a 7:3 ratio, while debt financing is sourced from the Export-Import Bank of China.

The capital of the project was invested by:

1. Mowan Railway Co., Ltd. with RMB 6 billion, accounting for 40%.
2. Beijing Yukun Investment Co., Ltd. (CIC) investing RMB 3 billion, accounting for 20%.
3. Yunnan Provincial Investment Holdings Group Co., Ltd. invested RMB 1.5 billion, accounting for 10%.
4. Lao PDR National Railway Co., Ltd. invested RMB 4.5 billion, accounting for 30%.

In detail, Mowan Railway Co., Ltd. is a Chinese enterprise consortium investment platform company with a registered capital of RMB 6 billion. It is funded by 4 companies including:

4.1. China Railway International Co. (RMB 3.75 billion, accounting for 62.5%), Ltd.

4.2. China Railway Engineering Group Co., Ltd. (RMB 1.5 billion, accounting for 25%).

4.3. Sinohydro Corporation Limited (RMB 650 million, accounting for 10.83%).

4.4. CRRC Qingdao Sifang Co., Ltd. (RMB 100 million, accounting for 1.67%.).

- **The role of the public and private sector**

During the construction of the China-Lao PDR railway project, in accordance with the principles of "equality and mutual benefit, common development, government guidance, and

enterprise operation", government departments, financial institutions, and enterprises from both China and Lao PDR cooperated closely. They innovated collaboration models, optimized financing schemes, leveraged integrated advantages, and facilitated the effective implementation of the project.

The guaranteed methods for the capital loan from the Lao side are as follows:

Firstly, during the repayment period, the Lao government arranges the national budget annually as the repayment source.

Secondly, the Lao government pledges the government revenue obtained from Chinese enterprise investment projects as repayment collateral. The debt financing is provided by the shareholders of the project company in proportion to their shares as general guarantee. The shareholders of the project company sign a guaranteed contract with the Export-Import Bank of China, agreeing to unconditionally repay the loan to the bank in proportion to their shares if the project company fails to do so. Among them, Chinese enterprises collectively provide guarantees covering 70% of the total loan amount, while the Lao National Railway Company provides guarantees covering 30% of the total loan amount.

The Chinese side has provided preferential policy support in terms of interest rates, loan terms, guarantee methods, and investment insurance for project debt financing. Additionally, Chinese shareholder companies have not only raised the required capital for the project in cash, but also provided general guarantee assurances for project financing loans, ensuring that the funds for railway construction are raised according to plan. This approach both alleviates pressure on the Lao government to provide sovereign guarantees for project financing and ensures that the project can commence and be completed on schedule despite potential difficulties in commercial financing operations.

5.9 Capricorn Bioceanic Corridor

SECTION A: Project Overview

- Sector: Transport
- Countries or economies involved: Argentina, Brazil, Chile, and Paraguay.
- Stated objective:

  The Capricorn Bioceanic Corridor is a trade and development road corridor that links the Atlantic Ocean – from the Port of Santos, in the Brazilian coast – to the Pacific Ocean – ending up in the Chilean ports of Antofagasta and Iquique. This project aims to develop the cross-border sections of the Corridor to make it operational through the construction and rehabilitation of infrastructure, which improves transport connectivity and efficiency.

- Main components:

  The corridor spans **2,396 kilometers**. The **cross-border aspects** of the **road project** encompass four countries. From the town of Porto Murtinho, Mato Grosso do Sul, Brazil, at the border with Paraguay, the route requires building a new international bridge between both countries, improving roads in Paraguay's Chaco region, passing through Argentina and, finally, crossing borders to reach Chilean ports.

  There are **four border crossings,** including two over rivers: 1) between Porto Murtinho, in the State of Mato Grosso do Sul, and Carmelo Peralta, in the Department of Alto Paraguay and, 2) from Pozo Hondo, in Boquerón, Paraguay and Misión La Paz, in Salta, Argentina.

  The other two are over land borders between Argentina and the Province of Antofagasta, in Chile: 3) Paso de Sico, in the Province of Salta, and 4) Paso de Jama, in the Province of Jujuy, as described in Map I below.

- (Estimated) Project cost:

  Each country is responsible for the costs of the project in its own territory, with various funding resources, as will be detailed.

- Financing arrangement: Public, including Public Enterprises / Multilateral Financial Institutions
- Expected/Actual year of commercial operation:

  The corridor is expected to be **operational by 2026.** Technically, some parts of the corridors in Chile and Argentina are already operational; however, operational efficiency is currently low.

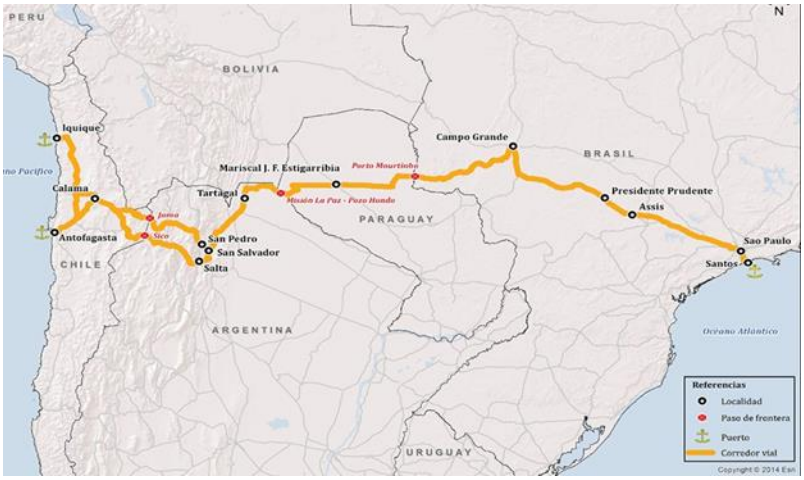
- Project outcomes, impact, and other highlights:

  The project increases trade opportunities, by reducing transportation costs and unlocking economic potential and stimulating investment. Furthermore, it promotes regional integration and fosters cooperation among participating countries.

  The broader economic and social impact of the project includes the fact that it constitutes **not only a transport and logistics trade corridor but also a growth corridor.** The beneficiaries are also the inhabitants of the towns and cities in the area of influence of the corridor, especially in border areas.

- Map(s) of the project:

Map I – Capricorn Bioceanic Corridor



Map II – Route inside Paraguay

SECTION B. Economic Rationale and Planning

- **Positive and negative externalities assessment**:

  Drivers: There is a **consistent economic rationale** in this project. Both intra-regional and extra-regional trade potential **underpin the corridor**.

  The increased economic connectivity through regional and international value chain integration and enhanced economic opportunities is key for the success of the project.

  To illustrate, agricultural production from the center-west of Brazil could arrive at Chilean ports and products and services from Paraguay, Argentina and Chile could reach Brazil more easily.

Improved border crossing practices, driven by lower transaction costs and times, are also present. The Bioceanic Corridor may **reduce by up to 17 days** the travel journey of commodities from the Brazilian state of Mato Grosso do Sul to the Asian market, compared to the Panama Canal. This applies to Brazilian products, such as pork and beef, embarking at Chilean ports, instead of using the terminals of Paranaguá (in the state of Paraná) and Santos (in the State of Sao Paulo).

Among the challenges, one can mention financial constraints to cover operation and maintenance costs, and the modernization of the management and governance processes required for investments to take place. Positive externalities go beyond this project: spillovers arise out of the fact that enhanced corridor management practices provide a model for long-term planning of other corridors, with improved project prioritization and coordinated implementation.

Main potential negative impacts will be localized, temporary and related to construction activities. These risks will be mitigated by good construction practices, enforced on the contractors performing the works.

- **Distributional analysis**:
  The corridor **contains several cross-border components for trade to flow properly.** Thus, there are differing levels of economic opportunities and benefits for each of the implementing countries. As fiscal space is limited in the countries involved, **financing arrangements** to back up those **components** depend on the budget constraints of each of the countries and their capacity to receive financial assistance.

  In general, all countries will benefit from improved road network, better service provision, more integration with key economic centers and improved cross-border linkages with neighboring countries.

- **Role of MDBs**:

  Continuous support from the regional development banks involved in the project includes technical monitoring and operational planning support in certain sections.

SECTION C: Political Support and Governance

Governance- Institutional Integration Framework:

The **Capricorn Bioceanic Corridor** is a flagship **institutional arrangement**. The **planning for the corridor** considered the deleterious effect of the lack of cross-border infrastructure for transportation on trade and development.

- Policy, legal, and regulatory alignment:
  There is strong political support for the project. The Bioceanic Corridor Initiative and its working group were established by the **2015 Presidential Declaration of Asunción,** involving the presidents of Brazil, Argentina, Paraguay, and Chile, and reinforced by **the 2017 Brasília Declaration**.[i] Therefore, it garnered buy-in at the highest level in all countries demonstrated by Heads of State.

- State capacities and inter-government institutional arrangement:

  In terms of governance structure and institutional setup for the design and implementation capacities, the participation of subnational entities is a key characteristic of the process.

A clear example is the Forum of the subnational territories of the Bioceanic Corridor. It takes place every year in a different state/province of the four involved countries. Those **governance arrangements** have shown resilience throughout political changes. While national governments of Brazil, Argentina, Chile, and Paraguay moved along the political spectrum, subnational cooperation has remained steady, with high-level support through different governments.

- Role of MDBs:

  Institutional support includes technical support through non-reimbursable funds. Given the limited fiscal capacity, grants and concessional loans for project preparation and technical activities facilitate governance implementation. Under the Regional Public Goods Initiative, the Interamerican Development Bank – IDB officially supports the **Regional Master Plan of Integration and Development of the Capricorn Road Corridor.** The objective is to establish a collaborative and articulated framework **to plan, manage and implement** the Bioceanic Corridor.

  The Executive Committee of Subnational States is an example of the capacity of subnational coordination. The first meeting took place in November 2023. It gathers representatives of the following entities: Province of Salta (Argentina), Department of Boquerón and Department of Alto Paraguay (both in Paraguay); State of Mato Grosso do Sul (Brazil) and Region of Antofagasta and Region of Tarapacá (both in Chile).

SECTION D: Finance and Management

- Funding sources and financial structure:

  The financial structure design depended on the needs of each section of the Corridor. The stretches within Argentina and Chile are in reasonable working order but have required certain operational improvements.

  In the Chilean side, this has involved investments of **US$ 2.6 billion**, led by the Ministry of Public Works of Chile. Regarding **public investments**, the following sections in the Chilean territory are highlighted: **Calama-Paso Sico** (276 km) – stage of engineering studies; and **Sico-Peine-Badequano** (237 km) - improvement works. There are also **four concessions**: two concessions are already ongoing, involving **Autopistas de Antofagasta** (201 km) and **Doble Vias Rutas del Loa** (136 km). Another concession is currently in the bidding process – **Antofagasta-Caldera (470 kms)**. Finally, the concession of **Antofagasta-Iquique (355 km)** is planned to start in 2025.

  In the Brazilian side, the construction of the Bioceanic Route Bridge between Porto Murtinho-BR and Carmelo Peralta-PY is financed by the Hydroelectric Power Plant of Itaipu. **The bridge will be 1,294 meters long and will cost approximately US$ 85 million.** Brazilian national budget secured the amount required to build the **access works to the international bridge and the border control center between Porto Murtinho-BR and Carmelo Peralta-PY**. The sources of funding are budget actions in the **updated values of R$ 472,410,911.22 (approximately US$ 90 million**). **The expected completion deadline is April/2026.**

  For the corridor to be fully functional, the main infrastructure requirements are in the territory of Paraguay. The first Paraguayan section of the corridor, inaugurated early in 2023, is **completed and connects Loma Plata to Carmelo Peralta**, as described in Map II, in green above. According to the report of the Ministry of Public Works and Communications (MOPC) of Paraguay, the works required an investment of **US$ 445 million.**

The role of the development banks has been essential. Regional development banks (IDB and FONPLATA) have played a key part in this process. The paving of the stretch between **Mariscal Estigarribia-PY and Pozo Hondo-PY** on PY-15 road **is the largest project financed in the history of FONPLATA - US$ 354.2 million.** The amount corresponds to FONPLATA's own resources and is being granted in three stages. Paraguay`s MPOC oversees the execution. The works, highlighted in orange in Map II above, include the **construction of a new road of 227.6 km, of which 219.5 km correspond to the improvement and paving of the section of the National Road PY-15**. The project also contemplates maintenance during the first eight years after the completion. Besides, it includes the **construction and installation of the Border Center in Pozo Hondo-PY, two weighing stations and toll booths**.

Risks identified and mitigated include potential delays in program execution and shortcomings in the projects that could lead to increased costs during the execution of works.

- The role of the public and private sector:

  No private investment is currently envisaged in the cross-border sections of the project, but private sector has a role to play in the concessions. Furthermore, private sector participation is highly encouraged in the development of the area of influence of the corridor (for example, related to logistics services, fleet and warehouse expansion, and social infrastructure at the border).

To sum up, the Capricorn Bioceanic Corridor is a good illustration of the power of **financing coordination** of **cross-border infrastructure projects** to deliver concrete results in the Southern Cone of South America.

5.10 Lesotho Highlands Water Project Phases 1 and 2

SECTION A: Project Overview

- Sector: Water Project, Energy Project
- Countries or economies involved: Republic of South Africa (RSA) and Kingdom of Lesotho
- Stated objective (if any): The project was to be achieved by storing, regulating, diverting and controlling the flow of the Senqu/Orange River and its confluences in order to affect the delivery of specified quantities of water to the Republic of South Africa (RSA) and thereby using such delivery system to generate hydropower in the Kingdom of Lesotho.
- Main components:

  Phase 1A, which was officially opened in January 1998, consists of the Katse Dam, transfer tunnels up to the Ash River Outfall and the Muela Hydropower Stations.

  Phase 1B, consisting of Mohale Dam and Mohale-Katse Transfer Tunnel, was officially opened in March 2004.

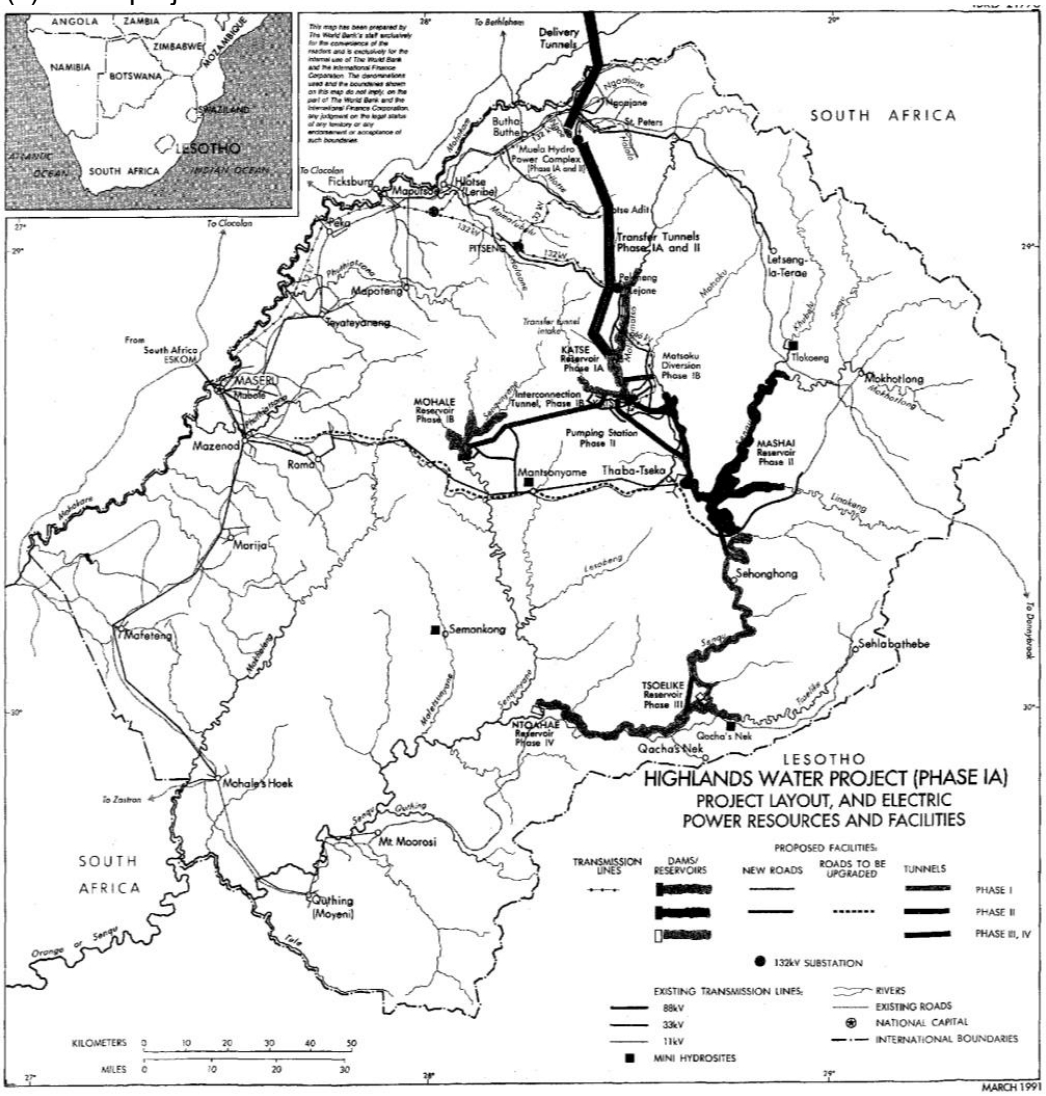
  Phase 2 shall consist of the following main components and associated infrastructure:

  - Polihali Dam: The Polihali Dam will be constructed downstream of the confluence of the Senqu and Khubelu Rivers and will be a 163.5 meters high concrete faced rock-fill embankment dam wall. The crest length will be 915 meters with a full supply level of 2 075 meters above sea level (MASL). A 49.5 meters high saddle dam will also be constructed as well as a side channel spillway.
  - Polihali to Katse Tunnel: A 38.2 kilometers long, 5 meters diameter tunnel will be constructed to transfer water from the Polihali Reservoir to the Katse Dam. The tunnel is sized to convey a peak power generation flow of 35 m3 /s.
- (Estimated) Project cost: USD 2.6 billion (Phase 1A, actual)[18]; USD 629 million (Phase 1B, actual)[19]; ZAR 32 billion (Phase 2, estimated)[20]
- Financing arrangement: Republic of South Africa, Kingdom of Lesotho, World Bank, etc. (Phase I); For Phase 2, the New Development Bank (NDB) will finance ZAR 3.2 billion. African Development Bank (AfDB) will finance ZAR 1.3 billion. The remaining balance will be financed by other Multilateral Development Banks, commercial and institutional investors through Bond Issuance by Trans-Caledon Tunnel Authority (TCTA).[21]
- Expected/Actual year of commercial operation: 2004 (Phase 1); 2027 (Phase 2)[22]
- Project outcomes, impact, and other highlights: The proposed project fits with the objective to deepen regional integration and promote industrialization in South Africa. It also realizes the GoKL's aspiration to boost benefits from its natural resources and develop its infrastructure to create the necessary enabling conditions for private sector development. Both South Africa and Lesotho are inextricably linked socially and economically, and the project is further cementing their relationship for mutual development. The Project is one of the Southern Africa

[18] World Bank Document
[19] Lesotho_Highlands_Water_Project-Phase_1B.pdf (worldbankgroup.org)
[20] 8-Lesotho-Water-II-00033.pdf (ndb.int)
[21] 8-Lesotho-Water-II-00033.pdf (ndb.int)
[22] South Africa - Lesotho Highlands Water Project (LHWP), Phase II - MapAfrica - African Development Bank Group (afdb.org)

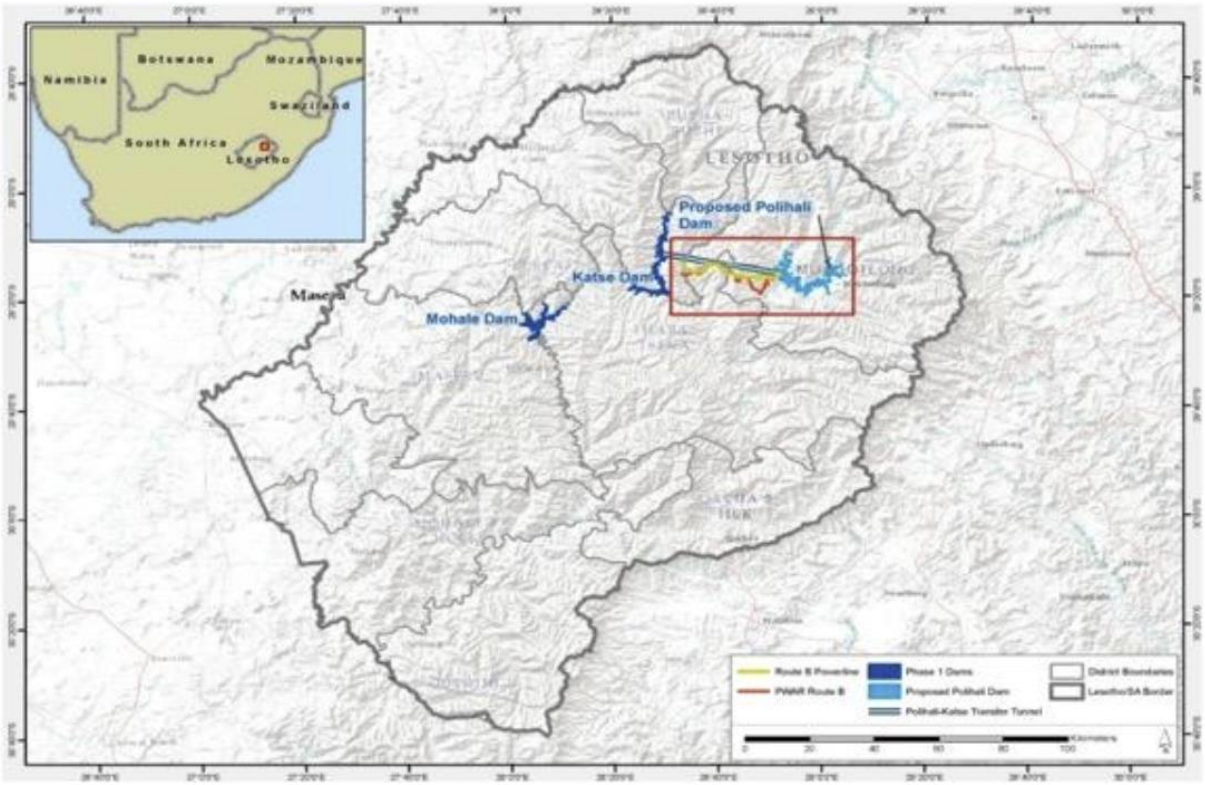
Development Community (SADC) priority water infrastructure projects for promoting regional integration.[23]

- Map(s) of the project:



Source (Phase 1A):The World Bank (World Bank Document)

[23] South Africa - Lesotho Highlands Water Project (LHWP), Phase II - MapAfrica - African Development Bank Group (afdb.org)



Source (Phase 2): African Development Bank (esia_summary_for_lesotho_highland_water_project_ii_-_polihali_western_access_corridor.pdf (afdb.org))

Disclaimer: All the maps are for illustrative purpose, and they do not represent the endorsement by AIIB, EBRD, and IDB on any country borders.

SECTION B: Economic Rationale and Planning

- Positive and negative externalities:
  1. Positive externalities:
     - The project vision was underpinned by a strong economic rationale. The growing water demand in South Africa, stimulated by rapid industrialization, could no longer be met by the Vaal River. The Lesotho Highlands Water Project offered a solution by diverting water from the water-rich Senqu (Orange) River in Lesotho to South Africa's economic heartland (Phase 1).
     - The project had broader economic and social impacts. It provided a reliable water source for South Africa's industrial and urban development, contributing to economic growth. In Lesotho, the project generated revenue through royalties and stimulated economic activity (Phase 1).
     - The project has the potential to positively impact on the economy of Lesotho, the employment of local workers and the livelihoods of Project Affected Persons

(PAPs). In addition, the project has the potential to positively improve the infrastructure and social services available to PAPs (Phase 2).

2. Negative externalities:

   Overall, the negative impacts of the project are associated with resettlement, which has the potential to result in social divisions, increased human vulnerability, crime and disease. However, if the project implements effective and sustainable mitigation strategies, resettlement has the potential to improve PAPs lives (Phase 2).

- Distributional analysis:

  1. South Africa:

     Costs: bears most of the project's costs.

     Benefits: the primary beneficiary of the water.

  2. Lesotho: receives royalties based on the volume of water delivered and benefits from infrastructure development and employment opportunities.

  3. Key Stakeholders:
     The key stakeholders in South Africa include the Department of Water Affairs (now Water and Sanitation), the Trans-Caledon Tunnel Authority (TCTA), and the end-users of the water. In Lesotho, the key stakeholders include the Lesotho Highlands Development Authority (LHDA), the government and communities affected by the implementation of the project.
     The distribution of costs, benefits, and impacts among stakeholders vary. The South African water users ultimately bear the cost of the water through tariffs. The Lesotho government and communities affected by the project receive(d) compensation and benefits from infrastructure development.

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment

  A comprehensive treaty was signed between South Africa and Lesotho to govern the project. This treaty evolved over time, with protocols added to address specific issues such as royalty calculations, cost apportionment, project governance and dispute resolution mechanisms.

  Major legal and regulatory barriers included disagreements over water allocation, royalty payments, and the interpretation of certain treaty provisions. These differences were/are addressed through negotiations, compromises, and the establishment of joint committees to oversee the project's implementation.

  Differences in rules, technical design, and operational standards are/were harmonized through the Joint Permanent Technical Commission (JPTC), which facilitated communication and cooperation between the two countries.

- State capacities and inter-government institutional arrangement:

  The governance structure of the project involves two parastatal organizations: the Lesotho Highlands Development Authority (LHDA) in Lesotho and the Trans-Caledon Tunnel Authority (TCTA) in South Africa. These organizations are responsible for the implementation and operation of the project within their respective countries.

  The Joint Permanent Technical Commission (JPTC) (now the Lesotho Highlands Water Commission) was established as an inter-governmental institution to oversee the project,

ensure compliance with the treaty, and resolve disputes. Its mandate included conflict prevention and resolution.

In Phase 1, the World Bank played a significant role in the institutional arrangement, providing technical assistance, financial oversight, and facilitating communication between the two countries.

The governance and institutional arrangements were adjusted throughout the project cycle to address emerging challenges and ensure effective coordination between the different stakeholders.

As part of Phase 2, the New Development Bank (NDB), African Development Bank (AfDB), TCTA and LHDA are signatories to a project agreement which regulates matters of a mutual interest, particularly reporting. This is needed given the unique nature of the project, where the borrower is TCTA and resides in South Africa, whereas the project developer is the LHDA, an agency of the Government of Lesotho.

Matters of a financial interest are also coordinated via a Finance Liaison Committee which is constituted by the South African and Lesotho delegations of the Lesotho Highlands Water Commission, LHDA, TCTA, officials of the Department of Water and Sanitation as well as officials of the National Treasury. Further, to monitor and manage fiscal risks emanating from contingent liabilities associated with the South Africa government guarantees, a Guarantee Monitoring Committee also sits quarterly with an interest in understanding project progress, risk management, expenditure against the long-term cost plan, etc.

These risks are further managed through a Guarantee Framework Agreement between the South Africa government and TCTA (as borrower) – this, inter alia regulates and outlines reporting requirements between the parties.

- Role of MDBs:

  Under Phase 1, the World Bank played a crucial role in facilitating the inter-governmental agreement and institutional arrangement. It provided technical assistance in drafting the treaty, advised on financial and legal matters, and helped establish the JPTC as a mechanism for cooperation and dispute resolution. Though the World Bank is currently not a funder, these measures have been retained under Phase 2.

SECTION D: Finance and Management

- Funding sources and financial structure:

  Under Phase 1, the cross-border nature of the project posed barriers and risks to financing, including political instability, currency fluctuations, and potential disagreements between the two countries. These risks were mitigated through a complex financial structure involving guarantees from the South African government, a trust fund mechanism, and the participation of the World Bank as a lender of last resort.

  Public investments were needed initially to fund feasibility studies, environmental assessments, and infrastructure development. These investments helped mobilize subsequent private sector investments in the construction and operation of the project.

  The financial structure was designed to allocate risks and benefits by ensuring that South Africa, as the primary beneficiary, bore most of the project's costs. Lesotho received(s) royalties and other financial benefits to compensate for the use of its water resources.

The Treaty entered into by the Government of the Republic of South Africa and the Government of Lesotho states that RSA is responsible for the water transfer costs of the LHWP and makes provision that the Lesotho project implementation body, the LHDA can raise finance with an RSA Government guarantee for such costs. Under Phase 2 however, it is envisaged that TCTA will be fully responsible for debt raising. In terms of Clause 11(6) of the Treaty signed, RSA is obliged to supply guarantees for the water delivery funding facilities (loans, credit facilities or other borrowings) entered into by TCTA and the LHDA.

TCTA is responsible for fulfilling all of RSA's financial obligations in terms of or resulting from the Treaty on the LHWP including the raising of money and the liability and financial risk management. Funding of the LHWP is sourced from both local and international financial markets.

In terms of the Treaty, the RSA Government is required to provide an explicit guarantee for LHWP. In terms of the Treaty: "the Republic of South Africa shall with respect to all loans, credit facilities or other borrowing procured by the Trans Caledon Tunnel Authority for the implementation, operation and maintenance of that part of the Project relating to the delivery of water to the Republic of South Africa, provide such guarantee as lenders of such loans, credit facilities and other borrowings may require". While the project is developed primarily for the benefit of South Africa and the secondary benefit for Lesotho through the hydropower generation, there is significant political risk since the assets are physically located in Lesotho, which is a sovereign state. It is highly unlikely that lenders would be prepared to provide funding without this political risk being mitigated through, for example bilateral agreements such as the existing Treaty, an explicit Government guarantee or political risk insurance from a multilateral institution which in turn would require some form of Government support.

Debt raised by TCTA is paid off through income derived from tariffs charged on the various users – these are mainly in the Vaal River System which supports South Africa's economic heartland. To manage liquidity risks, TCTA and the Department of Water and Sanitation began charging and collecting revenue from the users a few years before construction on Phase 2 began. This also ensures that TCTA's debt burden is limited ultimately assisting in managing contingent liability risks.

- The role of the public and private sector:

  During Phase 1, the split between financing sources was determined through a combination of public and private investments. The South African government provided guarantees and funding for certain components, while private sector contractors and lenders were involved in the construction and financing of other parts of the project. The private sector was incentivized to participate through a tender evaluation system that considered not only the cash price but also the financing package offered by the bidders. This encouraged contractors to secure favorable financing terms and contribute to the project's overall financial viability. The private sector brought several advantages to the project, including reduced costs through competitive bidding, innovative design and construction techniques, and efficient management and implementation practices.

  Phase 2 is financed mainly through debt as well as tariff income.

- Role of MDBs:

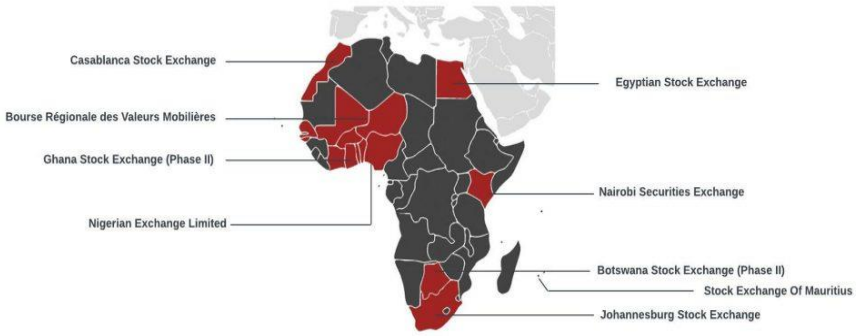
  During Phase 1, the World Bank played a crucial role in the project's financing. It provided concessional finance, which offered more favorable terms than commercial loans, and acted as a lender of last resort, providing a safety net for other lenders. The World Bank's involvement helped attract private sector investment and ensured the project's financial sustainability.

Under Phase 2, the AfDB and NDB were able to provide some level of concessional finance on account of Lesotho's status as an LDC.

5.11 African Exchanges Linkage Project (AELP)

SECTION A: Project Overview

- Sector: Finance (Capital Markets), Digital
- Countries or economies involved: Egypt, Morocco, Nigeria, Kenya, South Africa, Mauritius Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo, Botswana, Ghana, and Uganda.
- Stated objective (if any): The AELP is an initiative of African Securities Exchanges Association (ASEA) and the African Development Bank (AfDB) which aims to enable and facilitate cross-border trading and settlement of securities across participating African stock exchanges. The goal is to boost Pan-African investment flows, promote innovations that support diversification needs of investors in Africa, and help address the lack of depth and liquidity in Africa's capital markets.
- Main components: C1- Design of harmonized link trading infrastructure; C2 - Capacity Building for Capital Market Regulators, stockbrokers, securities exchanges, investors and listed companies in the participating countries.
- (Estimated) Project cost: USD 1,580,000 (Phase 1: $980,000; Phase 2: $600,000)
- Financing arrangement: Grant from the African Development Bank through the Korea Africa Economic Cooperation Trust Fund (KOAFEC).
- Expected/Actual year of commercial operation: Phase 1 Operational since October 2022. Phase 2 expected from 2025
- Project outcomes, impact, and other highlights:
    - The AELP has facilitated access to one-shop securities market where investors can access 17 countries' capital markets representing over 90% of Africa's securities market capitalization of USD1.4 trillion.
    - A new investor group, the African Stockbrokers and Securities Dealers Association has been established on the back of the AELP implementation to serve as a network of and securities dealers facilitating cross-border capital raise, trading and investments.
- Map(s) of the project:



SECTION B: Economic Rationale and Planning

- Positive and negative externalities:

3. Positive externalities:

   AELP enables investors to diversify their investments through access to the shares of a wide variety of over 1,200 listed companies in the continent. Harmonization of infrastructure enables access to capital markets information and data aggregation across the continent making reporting more effective and accessible. In the long run, AELP will enable cross-border capital raising for governments and companies to finance economic growth and expansion.

4. Negative externalities: N/A

SECTION C: Political Support and Governance

- Policy, legal, and regulatory alignment
- The AELP is widely supported by Ministers of Finance from the African Union members who recognize the project as a key component toward the actualization of the African Continental Free Trade Agreement (AfCFTA). The participating stock exchanges representing 17 countries have signed a Memorandum of Understanding for the participation and success of the AELP. The project has established a Regulatory Framework and broker-to-broker agreements that enhance collaboration for cross-border trading. Harmonized trading rules and regulations enhance market transparency and efficiency among participating members. State capacities, conflict resolution, and inter-government institutional arrangement

  The African Securities Exchanges Association (ASEA) seeks to fully integrate all its 26 member exchanges representing over 40 countries across the continent. Most markets, however, remain small and illiquid. Integration of these markets is anticipated to capacitate them to participate in the wider African and global capital market environment through Infrastructure investments, regulatory reforms to remove blockages on cross-border trading and movement of capital.

  ASEA's executive council and AELP Steering Committee have oversight over the implementation of the AELP. The ASEA has established a dispute resolution framework which is administered by the ASEA Secretariat and Steering Committee made up of representatives from all participating markets.

SECTION D: Finance and Management

- Funding sources and financial structure:

  The Project has been funded through a grant from the Korea Africa Economic Cooperation Fund (KOAFEC) administered by the African Development Bank. The implementation of the AELP is through a phased approach. Phase 1 grant was USD 980,000 (in effect from 2018 to 2022) and Phase 2 grant is for USD 600,000 (2023 – 2025).

- The role of the public and private sector: The executing agent is the African Securities Exchanges Association which is made up of over 26 member securities exchanges across

the African continent. The members contribute to the project through human resource volunteers from each of the countries. ASEA member exchanges which include both public and private sector ownership / governance partner with their respective governments for financial sector regulatory harmonization and capacity building initiatives to support the AELP.

References

ADB (2017). Guidelines for the Economic Analysis of Projects (adb.org)

Allen, T., & Arkolakis, C. (2014). Trade and the Topography of the Spatial Economy. *The Quarterly Journal of Economics*, 129(3): 1085-1140.

Bartelme, D. (2015). Trade costs and economic geography: evidence from the us. Working Paper. Univ. Calif., Berkeley.

Donaldson, D. & Hornbeck, R. (2016). Railroads and American economic growth: A market access approach. *The Quarterly Journal of Economics*, 131(2), 799-858.

Fajgelbaum, P. D., & Schaal, E. (2020). Optimal transport networks in spatial equilibrium. *Econometrica*, 88(4), 1411-1452.

Fujimura, M., & Adhikari, R. (2010). Critical Evaluation of Cross-Border Infrastructure Projects in Asia. Development Economics: Regional & Country Studies eJournal.

GIH (2018). Financing Cross-Border Infrastructure Projects Introduction—What is 'bankability'? (gihub.org)

GIH (2021). Connectivity Across Borders: Global practices for cross-border infrastructure project, gih_cross_border_web_final-11-02-21_updated-141022.pdf (gihub.org)

Pereira Dos Santos, P., (2018). Introductory Guide to Infrastructure Guarantee Products from Multilateral Development Banks.

Puga, D, (2008). Agglomeration and cross-border infrastructure, Working Papers 2008-06, Instituto Madrileño de Estudios Avanzados (IMDEA) Ciencias Sociales.

Ramondo, N., A. Rodríguez-Clare, & M. Saborío-Rodríguez. (2016). Trade, domestic frictions, and scale effects. *American Economic Review*, 106(10), 3159-84.

Redding, S. J. (2016). Goods trade, factor mobility and welfare. *Journal of International Economics*, 101, 148-167.

Scatigna, M, D Xia, A Zabai & O Zulaica. (2021). Achievements and challenges in ESG markets, *BIS Quarterly Review*, December, pp 83–97.

Siddiqui, S., Vaillancourt, K., Bahn, O., Victor, N.M., Nichols, C., Avraam, C., & Brown, M. (2020). Integrated North American energy markets under different futures of cross-border energy infrastructure. Energy Policy, 144, 111658.

UNOPS (2021). Infrastructure for Climate Action.

World Bank (2007). The Nexus Between Infrastructure and Environment from the Evaluation Cooperation Group of the International Financial Institutions. Evaluation Brief 5.

Xiao, G, (2021). Cross-border Infrastructure Financing: Economic Corridor Management, UNESCAP

[i] 2015 Asunción Declaration on Bioceanic Corridors is available at: https://difrol.gob.cl/download/declaracion-de-asuncion-sobre-corredores-bioceanicos and 2017 Brasilia Declaration at https://www.gov.br/mre/pt-br/canais_atendimento/imprensa/notas-a-imprensa/atos-adotados-por-ocasiao-da-li-reuniao-do-cmc-e-da-li-cupula-de-chefes-de-estado-do-mercosul-e-estados-associados-brasilia-20-e-21-de-dezembro-de-2017