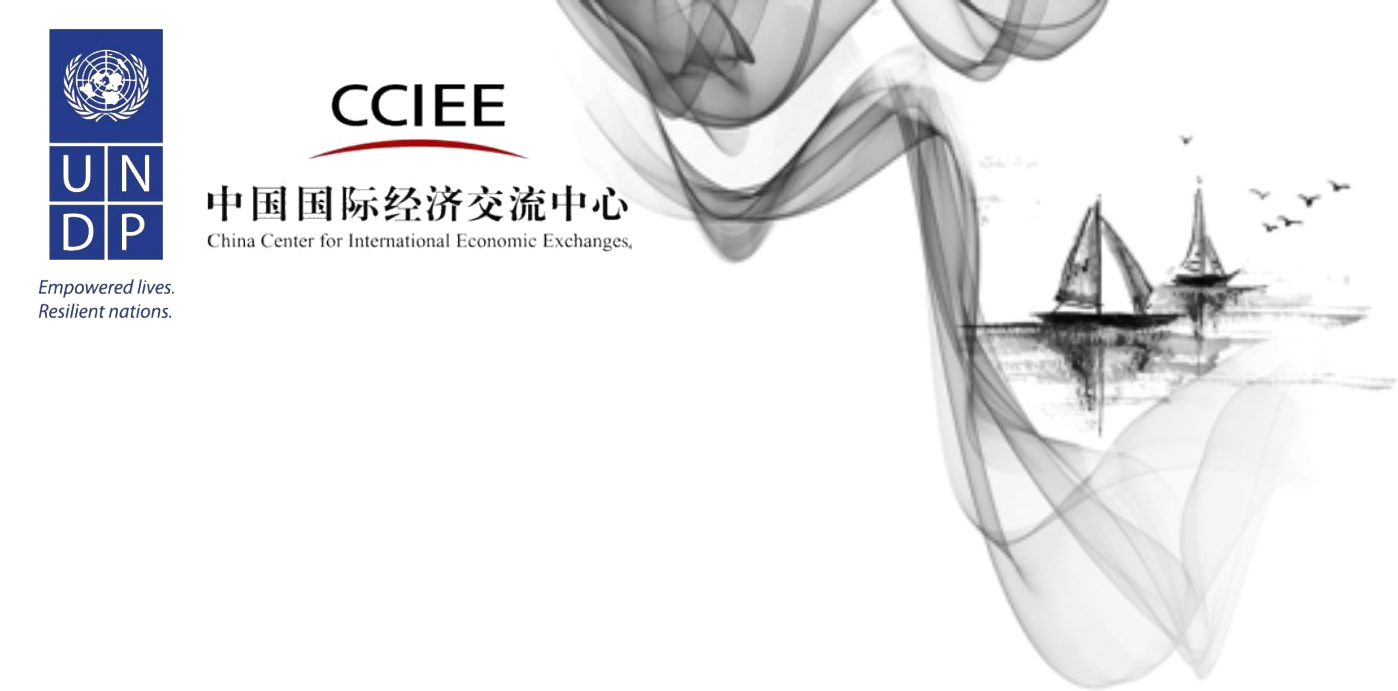

Promoting the Sustainable Development of Transport and Economic Corridors Under the Belt and Road Initiative

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"BELT AND ROAD": A NEW PATH TO REGIONAL DEVELOPMENT

SCOPING PAPER 3

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Executive summary

Developing transport corridors that deliver sustained economic, social and environmental benefits is a core goal of the Belt and Road Initiative. This paper examines the potential of transport corridors to deliver these benefits. It does so through two approaches. First, the paper examines previous experiences in the implementation of transportation infrastructure projects and economic corridors. Second, the paper reviews best practices in policy interventions for sustainable development and how these may be applied to corridor development. These approaches serve to illustrate learnings that will support the successful implementation of the BRI in the long-term, and draw lessons for useful and actionable policy recommendations for developing BRI corridors that achieve sustainable development.

We show in this paper that corridor developments historically began with transport linkages that were intended to facilitate development along intra-national routes. Later stages of corridor development focused both on complementary infrastructure (such as hinterland transport and economic development) and cross-border transport and economic integration. Once the physical infrastructure was established, a services infrastructure typically followed, enabling a deepening of economic development.

What economic corridors have historically achieved was determined by various factors, including their own geography, as well as policy interventions. Using examples from Europe and the Pearl River Delta, we show how the impact of corridors can be transformative for all the economies of the region, from the less to the more developed. The role of public policy emerges as crucial to capture economic benefits, especially with regard to facilitating the easy movement of goods and services with minimal distortions introduced by fiscal, regulatory and physical barriers. A focus on hinterland infrastructure also emerges as important.

We then turn to policy interventions for sustainable development. A key lesson from the case studies is the importance of focusing on three approaches: (1) SME support for economic development, (2) Pro-poor policies for human capital development, and (3) Environmentally friendly provision of basic services – water, sanitation, hygiene and electric power.

We argue that corridors can improve the provision of all three aspects noted above. For instance, proper infrastructure planning can help by locating large-scale manufacturing away from residential areas and thus help convert city occupations into SME-focused, high value-added services. Pro-poor policies include supporting affordable housing communities, and addressing education, health, and long-term financial risks faced by underprivileged populations in rural and urban areas. Corridors can help by improving access to health and education services both by reducing the cost of providing such

services and enabling access to remote tertiary services, such as distant hospitals. Corridors expand markets and thus enable banks to pool underprivileged borrowers in order to economically provide financial risk management services. Third, the construction of a corridor offers opportunities to mitigate the environmental consequences of pollutant generating activities related to basic services. For instance, landfills can be located at appropriate distances from water sources and human habitation; waste collection becomes more economically viable, and can replace waste burning, especially in remote areas.

There appears to be no substitute for a strong governmental commitment to spending the necessary resources on these services and to support change with effective policy reforms. Some of these changes will require multilateral, intergovernmental commitments on broad areas such as property rights and environmental commitments, and some changes require regional and bilateral commitments, such as on trade facilitation. Other commitments are specific to national situations, such as pro-poor policies regarding route planning and access to health and education services, trade and banking processes, and environmental compliance mechanisms. The final section of our paper discusses these policy priorities at various levels.

Introduction

Developing the transportation infrastructure across Asia, the Middle East, North Africa and Europe is at the core of the Belt and Road Initiative (BRI). BRI aims at "linking up unconnected road sections, removing transport bottlenecks, and improving road network connectivity." Also, it emphasizes "connectivity of customs clearance, reloading and multimodal transport between countries.... port infrastructure construction, ... smooth land-water transportation channels, ... port cooperation, ... information technology cooperation in maritime logistics, ... comprehensive civil aviation cooperation, and ... aviation infrastructure". (National Development and Reform Commission, 2015)

The corridors under BRI are intended to contribute positively to sustainable development.[22] By sustainable development is meant the inclusive, integrated and long-term social and economic progress of the impacted populations – through the work they do, the environment they live in, and their socio-economic status.

Many corridor initiatives have, in the past, brought economic development. However, the link between corridors and sustainable development has not to be taken for granted. To our knowledge, in modern times, there have been no corridor initiatives that enabled a rapid and sustained movement simultaneously in the economic, environmental and social dimensions of development. More typically, corridors raise incomes, but are accompanied by greater inequality, environmental degradation and higher economic vulnerability. To accomplish sustainable development, corridor initiatives will need to display a level of long-term thinking, creative design and multi-dimensional approaches to implementation that is likely unprecedented.(Berke, 2002)

Particular care will be needed for corridor initiatives that connect areas at different stages of development, since the potential for sacrificing sustainable development in return for rapid economic growth in the short-term can be high. In such cases, the economic, environmental and social aspects should be a primary focus, involving major efforts by governments, investors and various stakeholders from the earliest stages.

Considering the potential of BRI to contribute to global infrastructure development, previous experiences in the implementation of transportation infrastructure projects and economic corridors and an understanding of best practices in policy intervention may serve to illustrate learnings that will support the successful implementation of the BRI in the long-term. In this spirit, this paper will draw lessons in order to offer useful and actionable policy recommendations for developing BRI corridors that achieve sustainable development.

1. Connectivity and sustainability: identifying linkages

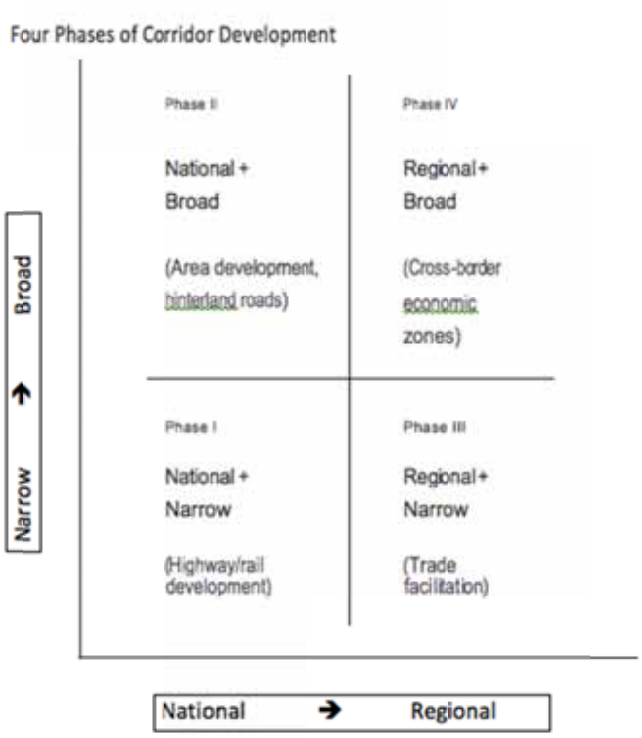
Whereas economic corridors imply multiple dimensions of economic development, transport corridors are a primary area of focus in infrastructure development and trade

[22] Source: http://www.worldbank.org/en/topic/sustainabledevelopment

facilitation strategies. (Adzibgey, Kmaka, & Mitiku, 2007) Arnold, Olivier, and Arvis (2005) define a corridor from a physical perspective as a 'transport corridor', i.e., a collection of routes constructed from the transport networks of adjoining countries and bounded by gateways. Corridors can at times be multi-modal and include multiple border crossings. 'Economic corridors' (Brunner, 2013) develop out of transport corridors, connecting economic agents along a defined geography, linking economic nodes or hubs, in which large amount of economic resources and actors are concentrated. By doing so, they link the supply and demand sides of markets.

Corridor development thus goes through multiple stages. The following diagram illustrates this. It is adapted from Srivastava (2011) and also referenced by De and Iyengar (2014).

Figure 1 - Four Phases of Corridor Development



In Figure 1, the vertical axis shows outcomes, which range from 'narrow', i.e., outcomes directly attributable to the physical infrastructure, to 'broad', i.e., outcomes that influence the area's economy. The horizontal axis differentiates national from regional outcomes. Phase I is a typical starting point for corridor development. It is an infrastructure intensive phase, marked by the development of intra-national transport corridors consisting typically of highways and rail links. Phases II and III may occur simultaneously, Phase II focusing on area development and minor road infrastructure,

and Phase III on cross-border trade facilitation (logistics, lowering tariff and non-tariff barriers, etc.). Phase IV focuses on cross-border development.

What economic corridors ultimately achieve is determined by various factors, including their own geography, i.e., their physical and socio-economic features. (Brunner, 2013) A corridor begins with physical connectivity as transport is enabled and other pieces of the physical infrastructure are added. With the growth of the corridor, a services infrastructure should follow. Connectivity in financial (e.g., services such as banking and insurance), social (e.g., human resources, institutional set-ups) and digital (e.g., information and communication technology) terms will need to be in place to ensure a complete transformation to an economic corridor.

While transport corridor planning can address some aspects of sustainable development, such as ensuring that hinterland roads address the needs of rural populations,[23] public policy is needed to address other key aspects as well. For instance, transport links should not only provide physical access to resources, but also enable producers, particularly SMEs, to take advantage of opportunities in domestic and foreign markets, leading to economies of scale and specialization. (Trace, Frielink, & Hew, 2009) In this way, people and goods can be moved more quickly at lower costs, thus facilitating economic interactions among agents based on their comparative advantage.

The sustainable development gains, however, can go far beyond economic benefits. In fact, economic corridor should support pro-poor growth. There is still much to be leveraged with enhanced connectivity, which opens up alternative and potentially more lucrative livelihood opportunities, and provides access to goods and services (e.g., electricity, energy, health, education) previously unavailable or too costly. (De & Iyengar, 2014) All of these have far-reaching consequences for public welfare, including poverty reduction and inclusive growth.

Development gains could also arise from aligning environmental sustainability to the initial planning and design of the corridors. Risk mitigation and reducing environmental and climate change impact from the beginning could contribute to significant reduction of greenhouse gas emission and air pollution, preserve landscapes, biodiversity, heritage, communities, and the built environment. Furthermore, they could also boost efficient and sustainable waste and water management while improving living conditions and mitigating climate change related risks. Furthermore, connecting green innovative logistics solutions, including information systems, collaborative models, and technology can contribute to long-term upgrading and development across regions.

In summary, the three pillars of economic, social and environmental benefits form the vital parts of what can be called as sustainable development gains. It should, however, be born in mind that sustainable development gains do not automatically ensue alongside corridor development. To give an example, not all segments of populations may be able to realize fully the benefits from corridor development, either because they are only

[23] See: http://ecdpm.org/great-insights/territorial-development-2/corridors-as-industrial-policy-linking-people-policies-and-places/; For an interesting example, see: http://www.livingtransport.com/results.php?t=asset&search=269

partially connected or because individuals vary in their capacity to take advantage of new opportunities unraveled to them. Intentional interventions or, in other words, the strategic alignment between inclusive impacts and corridor design could help enhance developmental gains in a sustainable manner. This will require an understanding of the linkages between the pillars, the areas of opportunity, and the areas of policy intervention.

2. Assessing opportunities of transportation and economic corridors: from where can BRI countries learn?

In this section, we illustrate, through two case studies, first the benefits of transport corridors (as described in Phases I and III of Figure 1) in Section 2.1, and then the wider economic benefits of area and regional development as the corridor develops (Phases II and IV of Figure 1) in Section 2.2. We then draw lessons for sustainable development strategies (Section 2.3).

2.1 Transportation linkages: the Trans-European Transport Network (TEN-T)

Transport corridors, as typically understood, consist of physical infrastructure such as fixed structures (roads, railway), networks (pipelines, communication lines) and nodes (terminals, seaports, airports), vehicles that navigate this physical infrastructure, and associated services that support and smooth such movement (for example, warehousing, insurance, logistics etc.). Such corridors are a means of moving people (for business and personal reasons) and goods/freight/services (raw, intermediate, final) from one location to another.

Scholars generally agree that good transportation infrastructure facilitates economic growth and development (Agénor, 2010; Barro, 1996; Janelle & Beuthe, 1997; Romp & De Haan, 2007), though the research on transportation as a stand-alone developmental factor is scarce. (Janelle & Beuthe, 1997) Among available estimates, in Peru, intercity highway upgrades increased the average annual rates of growth for exports (by 6%) and employment (by 5%). In China, connecting cities with railroads has moderately increased county-level GDP per capita.[24]

The Trans-European Transport Network (TEN-T), initiated in 1990, illustrates the potential of a transport corridor. TEN-T includes road, rail, air, and water (both sea and inland waterway) transport networks. Along with telecommunications (eTEN) and energy (TEN-E) networks, TEN-T part of a broader Trans-European Network (TEN) system. TEN-T includes nine core transport corridors, with the North Sea-Mediterranean Corridor being the major one.[25] Within this last corridor, a high-speed train (HST) system

[24] http://www.worldbank.org/en/topic/transport/brief/connections-note-24

[25] This corridor is the only one that connects Ireland and northern United Kingdom to mainland Europe, via Netherlands, Belgium and Luxembourg, and then goes farther to southern France and the Mediterranean Sea. The North Sea-Mediterranean Corridor also includes key European infrastructure such as the Channel Tunnel, three of Europe's top-five airports (London-Heathrow, Paris-Charles de Gaulle, and Amsterdam-Schiphol), and four of Europe's top-ten seaports (Rotterdam, Antwerp, Amsterdam, and Marseille).

has been built with Brussels as a hub located on the intersection of different transport nodes. (Albrechts & Coppens, 2003)[26] The Eurostar HST was created, financed, and is now operated by a unified management company, with the main shareholders being the British, French and Belgian government railway companies.[27]

The main benefit of the North Sea-Mediterranean Corridor is the facilitation of passenger flows and freight movement.[28] The corridor experienced 9% growth in traffic (ton-kilometers transported, across borders) and 12% growth in capacity (kilometers of paths, prearranged/timetable/bookings, across borders) since its completion in 2013 until the end of 2015. (RFC Northsea-Med, 2015) The use of HST means not only less air traffic but also less environmental pollution, as trains generate less carbon emissions than air transport. Consequently, the transport choice and optimal utilization of transport modes arises as a strategic response to mitigate the environmental impact of corridors.

Impact mitigation of greenhouse gases in corridors draws attention to the potential of `green corridors` as a means to deliver transport solutions more economically, socially and environmentally sustainable. Efficiency and optimization of mobility, higher safety, improved impact on the climate and the environment, and lower operational costs could make it a distinctive feature. At the same time, innovative logistics solutions, including information systems, collaborative models and technology could create significant spillover effects. (Kyster-Hansen, Thisgaard, Henriques, & Niss, 2011)

Since the North Sea-Mediterranean Corridor was completed only in 2013, a comprehensive impact evaluation is lacking. However, there exist some early indications that the corridor has transformed former depressed industrial areas along its route (for example, in its Brussels connection) to more vibrant communities where real estate developers actively seek new opportunities for office space and residential buildings that have also resulted in a surge of housing and rental prices in those areas. (Albrechts & Coppens, 2003)

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http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/index_en.htm; http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/northsea-med_en.htm; NSMED Core Network Corridor, Final Report 2014

[26] The corridor consists of the north-south network from Amsterdam to Brussels and Paris (and farther to Marseille via French RER) and the east-west Eurostar train between London and Europe's mainland (Brussels, Paris, and Lille).

[27] In 2015, Britain sold 40% of its shares to private investors http://www.eurostar.com/uk-en/about-eurostar/our-company/behind-the-scenes

[28] For example, the travel via Eurostar train from London to Paris takes about an hour less time than the air flight. In 2009 this HST had about 71 percent of the market for passenger trips between London and Paris or more than 8 million passengers per year (and 65 percent market share for the London-Brussels route), and its share was projected to grow. http://eurostar4agents.com/all-about-eurostar/why-travel-by-eurostar-to-paris; http://www.ft.com/cms/s/0/67ed5b0c-bf1e-11dc-8c61-0000779fd2ac.html?nclick_check=1#axzz4II2pOhH2

BOX I. How TEN-T could apply to BRI

TEN-T's example of multinational cooperation in building and operating the transport network across countries can serve as a model for BRI cross-border implementation. Potentially, the Trans-Siberian Railway (TSR) could become a major rail corridor of the BRI as it connects China's seacoasts and hinterland with Mongolia and major cities of Russia's Far East up to Moscow.[29] The route is almost 5 thousand miles long and takes six nights one way to complete under current infrastructure conditions (as compared to about 7 hours for a non-stop flight). With railway upgrades to Eurostar standards, the travel time can be reduced to a third of the current time, and the route can thus become more attractive for passengers and freight.[30]

A potential benefit of improved TSR could be illustrated by looking at two big cities along its far eastern route – China's capital, Beijing, and Mongolia's capital, Ulaanbaatar. Currently it takes about 28 hours by rail and about 2 hours by air to travel the 965 miles (1,553 kilometers) between the two cities. With the rail infrastructure upgrade to high-speed rail, the train travel time can be reduced to within10 hours.

Half of Mongolia's three million population lives in its Ulaanbaatar. Mongolia is a rich source of minerals, with mining of all kinds (copper, coal, gold, silver, uranium etc.) being its leading economic sector and located mostly along its southern border with China. China is Mongolia's main trade partner, importing more than 60 % of Mongolian mining exports and is Mongolia's largest source of imports, consisting largely of manufactured goods.

Beijing's transition to a post-industrial city with a sophisticated service sector (financial services, retail, wholesale trade, IT, and real estate) puts it in a position to consume an enhanced output of primary goods shipped from Ulaanbaatar.

Beijing can also provide the legal, financial and business infrastructure to support Ulaanbaatar's growth and transition from a commodities supplier to an industrial state, and introduce environmentally-friendly industrial practices. It can also stimulate infrastructural development into Mongolia's hinterland. The result of these investments would be to gradually integrate Mongolia into the supply-chain of manufacturing, of which China is the Asian hub.

2.2 Economic Linkages: the Pearl River Delta economic and transport corridor

A key benefit of transport corridors is the integration of the economies of the regions that are linked by corridors (along the lines of Phase IV of Figure 1 above). Regional integration is known to stimulate merchandise trade due to the reduction of trade barriers between geographically proximate trading partners. In particular, regional integration offers the following benefits over and above the benefits available from reduction of

[29] http://www.seat61.com/SilkRoute.htm#Ürümqi - Xian – Beijing

[30] An alternative railroad from Beijing to Moscow goes through Kazakhstan (with connections to Kyrgyzstan and Tajikistan) but is less developed than the TSR and requires more investments and upgrades.

trade barriers that apply to all trading partners, not just proximate ones: (1) The creation of supply-chains in which each location specializes in elements of a supply-chain, with the final product destined for remote locations. (2) Lower transport costs between locations, due to physical proximity, enables lower costs of accessing cross-border markets. (3) Newcomers to trade in merchandise can learn from the superior services offered by the more established trading economies, such as marketing, finance, business process management, manufacturing technologies, and other services. Such learning involves the transfer of tacit knowledge that is only possible if there is face-to-face interaction between the less-developed and more-developed locations along the corridor. Regional trade is often understood as being enabled by lower tariff barriers. However, non-tariff barriers, such as differences in inspection regimes and certifications, can also be significant. In many countries, non-tariff barriers have been observed to be costlier than tariff barriers.

A successful example of the development of economic corridors through the prior creation of transport corridors is to be found in the cities of the Pearl River Delta. Building on earlier established special economic zones, starting in the late 1980s, a transport corridor between Hong Kong, Macau and the major cities of Guangdong Province was developed, consisting of high-speed rail, expressway and sea links connecting all the major cities of the Pearl River Delta. The provincial government of Guangdong Province simultaneously began developing the hinterland infrastructure. The next step was a lowering of cross-border tariff and non-tariff barriers in the early 1990s. By the mid-1990s, the seamless movement of people across the region was enabled by lowering entry barriers.[31]

The benefits to Guangdong Province from the corridor were for the following reasons: (1) Hong Kong was already a developed economy with high levels of human capital and high standards of compliance and transparency in banking, business processes, and regulation at the time corridor development began. Removing the barriers to investment and people movement enabled Guangdong Province to rapidly move up the value-chain by learning from Hong Kong's business practices. (2) Hong Kong already had a developed banking and currency system which could be leveraged to provide capital for investment in Guangdong Province.

It needs to be emphasized that, just as Guangdong Province was transformed by the corridors of the Pearl River Delta, so were Hong Kong and Macau. Hong Kong's traditional industry of light manufacturing up to the 1980 changed to providing business services to support industrial activity in Guangdong Province. Initially focusing on re-exports, Hong Kong adapted to the growth of port infrastructure in Guangdong Province, moving to offshore trade and finance, and air cargo services.

An important reason why the transport corridors of Europe and the Pearl River Delta region were able to improve sustainably was that even the poorer areas within the region

[31] All four modes of services envisaged under the World Trade Organization – cross-border trade, consumption abroad, commercial presence and presence of natural persons, were enabled by these transport corridors.

were already endowed with a high stock of human capital, were spatially cohesive, and had strong rules regarding property rights and compliance when they entered into collaboration with the wealthier areas for corridor development.

The Pearl River Delta region economic corridor also faces challenges that arose from regional integration. For instance, the cities of Guangdong Province adopted the business standards and regulations of Hong Kong and Macau, to the extent possible. Where these were of high quality, such as in banking and business process management, there were great benefits. However, where there were weaknesses in the standards of Hong Kong and Macau, such as in environmental protection, these weaknesses were also 'imported' into Guangdong Province.

2.3 Summarizing the Lessons Learned

The European experience with visualizing, designing and financing the TEN-T corridor provides a constructive basis from which to examine how transport corridors under BRI should be designed. It shows that investing in adequate physical infrastructure is a key starting point, as was shown earlier in Phase I of Figure 1. Since, at present, many commodity chains are international, i.e., they include multiple movements and transactions across national borders before the product reaches the final consumer, reducing time on freight transport routes across different countries and regions reduces total costs. (Rodrigue, Comtois, & Slack, 2013) Particular attention needs to be paid to reducing non-tariff barriers, in addition to tariff barriers. Moreover, the 'logistic hubs' that combine inland ports, train terminals and warehousing are key for saving resources and facilitating multimodal transportation utilization.

In addition to physical infrastructure to permit the physical movement of goods along transport corridors, attention must be paid to the flow of people. This is often an issue, including in such success cases as TEN-T. The major issues are gaps in transportation nodes (or hardship in their accessibility), especially for continuous rail and/or inland waterway services, and differences in transport and traffic standards across borders (e.g. train length regulations). Also, as economic and business activities tend to cluster along the transport corridor (which is linked to more economic growth but also to more congestion and pollution), it is important to encourage hinterland networks from the corridor. Yet another challenge is to expand the potential of these hinterland multimodal networks via public-private partnerships rather than using only public funds. The case of the Pearl River Delta showed how attention paid to the movement of people enabled the development of an economic corridor.

BRI promises faster and cheaper access to destinations, broader distribution systems of goods, services and ideas, and less clustering. But in order to succeed in its goals, BRI participants will need to extensively communicate, coordinate their transport infrastructure development efforts, work on removing institutional barriers, upgrade old and build new joint international networks. BRI would also require substantial financial investments and a high degree of cooperation between all parties.

Many of the BRI countries are currently starved of investment due to their low levels of economic development, in turn due to low investment. Regional integration can also be a way to incentivize capital-rich states to invest in capital-poor states.[32] This requires enabling regulations, compatible business processes, and financial access. For instance, regulations on property rights will be an important determinant of whether overseas investors will be willing to risk investing capital in a country.

However, as noted earlier, in both Europe and the Pearl River Delta, even the poorer areas within the region were already endowed with a high stock of human capital, were spatially cohesive, and observed property rights and related rules at the time that they entered into collaboration with the wealthier areas for corridor development. This is unlike the situation in the BRI countries, where poorer countries suffer from low levels of internal economic integration, compliance, and human capital. Merely investing in physical infrastructure and facilitating the movement of people and services in addition to goods may not overcome these inadequacies.

Further, proper sequencing of reforms will be needed. For instance, tariff and non-tariff barrier reductions should be in place by the time transport corridors are built in order to encourage economic development that is based on regional comparative advantage rather than on intra-national comparative advantage. We turn to the challenges in the next section.

3. Evaluating the challenges to make corridors more sustainable and unleash development dividends

As the literature has noted, the economic benefits of a corridor encompass the following: (1) reducing transport and production costs, (2) creating jobs, (3) expanding productive capacity, (4) improving access to markets, and (5) reducing prices of final goods and services. (Gekara & Chhetri, 2013; Holl, 2004)

How may these gains be incorporated into a sustainable development strategy? In the earlier section, we concluded with a number of challenges to attain sustainable development. In this section, we evaluate key examples of the economic, social and environmental challenges. In presenting separate analyses, we are aware that these are often linked – for instance, the poor often bear the brunt of an unclean environment, and poverty may create environmental challenges. (Reardon & Vosti, 1995) We shall bring these analyses together at the end of this section.

3.1 Sustaining the economic gains of development – focusing on SMEs

SME development is viewed as a key component of economic sustainability. In most countries around the world, SMEs employ over half the workforce. Many places have

[32] https://www.ft.com/content/80c6e51a-4ccf-11e6-88c5-db83e98a590a

been transformed due to the development of their SME sector. Examples includes Italy, Germany and the Scandinavian countries among many others in Europe, while in Asia, the outstanding examples of SME-led growth include China, Singapore, and Sri Lanka. Yet, in many poor countries in the BRI region, SMEs are not the engines of innovation, employment and growth that they should be. Instead, largely due to inadequate human capital, poor access to finance, and overcomplicated tax systems, SMEs in such countries tend to put out low-end services and goods.

As global value chains (GVCs) managed by multinational corporations dominate the world trade system, there are opportunities for SMEs in the BRI countries to become part of this global system. (World Economic Forum, 2012) In GVCs, SMEs usually play the role of subcontractors or suppliers of intermediate goods. (Asian Development Bank, 2015; Zhang, May 2014) However, to succeed and be integrated, SMEs should be competitive and connected to the markets. An Asian Development Bank survey of SMEs in four Asian countries (Kazakhstan, Papua New Guinea, the Philippines, and Sri Lanka) found that product quality, skilled labor and strong customer relations are the most important for SMEs' successful integration into the GVCs. Access to finance and investments are also vital. (Asian Development Bank, 2015)

To attain sustainability of SMEs, industrial clusters around transport corridors should contain a mix of large firms and SMEs. The former's contribution to sustainability is through GVC management and ensuring compliance within the cluster of high standards of business process management, including, crucially, environmental standards. The role of the SMEs is to focus on skills and innovation. The relevant skills include both technical skills and business management skills. The second lesson is that policymakers play an important role. First, policymakers should institute high standards of compliance with regard to property rights, including assets, intellectual property, wages and environmental standards. Second, to support skills development and innovation within SMEs, the state should invest in vocational skills training. Third, to encourage SME formation, policymakers should focus on increasing the ease of doing business by SMEs through rules that reduce the cost of new business formation and closure, contract enforcement and related rules. Many of the BRI countries offer formidable challenges to new business formation that should receive policymaker attention.[33]

3.2 Sustaining the social gains of development – focus on the underprivileged

Improving physical connectivity has been shown to increase agricultural productivity by reducing travel time to agricultural markets, inducing farmers to adopt modern farming techniques and favor cash crops, and raising market participation. Improving road quality has also been shown to induce migration of labor from agriculture to manufacturing. (Ostrom, Schroeder, & Wynne, 1993; Shenggen & Zhang, 2004) The improvement of

[33] http://www.doingbusiness.org/rankings

connectivity should be supported by policies to favor farmers to create cooperatives and insurance systems that can enhance welfare by insuring farmers against bad weather.

We argued, in Section 2, that one of the key strategies at the heart of BRI's corridor initiatives should be the intergenerational sustainability of human capital across the region's geography, i.e., that the key benefit of the corridor should be a multi-generational upward shift in the productivity of persons in the impacted regions. The most relevant indicators of quality of life must be addressed, including education, health, and long-term financial risk of the underprivileged populations in rural and urban areas.

Adequacies of health and education services are common public challenges in poor countries. There appears to be no substitute for a strong governmental commitment to spending the necessary resources on these services.[34] However, ensuring that the poor derive benefits from public spending on health and education is no easy task. (Castro-Leal, Dayton, Demery, & Mehra, 1999) Corridors can help by improving access to health and education services both by reducing the cost of providing such services and enabling access to remote tertiary services, such as distant hospitals. (De & Iyengar, 2014; Hayami & Ruttan, 1971)

An aspect that usually needs urgent attention is addressing long-term financial risks faced by the poor. The poor need financial capital for basic housing, children's education and a variety of other needs. The assets of the poor lie primarily in their human capital, which is rarely considered bankable. (Narayan, Chambers, Shah, & Petesch, 2000) Addressing this issue is possible through policies that recognize human capital as a bankable asset, such as through housing finance programs that link repayments to earnings. (Mehta & Mehta, 1991) Corridors expand markets and may thus enable banks to pool underprivileged borrowers in order to economically provide financial risk management services.

In the absence of pro-poor policies, disparities and social vulnerability may be augmented by corridors. For instance, when corridors connect commodity producing regions with consuming regions, even sustained demand for primary goods from the supply location may not lead to large improvements in the quality of life for the latter. Instead, the supply centers may remain dominated by low-end production while its residents remain poor and subject to large variations in income as commodity prices vary. Moreover, rapid degradation of land due to overfarming and overmining, transfer of land ownership to large, corporate interests, and inadequacy of basic human services may result, creating challenges for the environment and equality. Further, if investment in health and education in rural and urban areas is inadequate, the long-term gains of development may be compromised. The residents' only path to sustainable development may then be through migration along the corridor to the urban area, which would have other costs in the form of overcrowded

[34] Studies have shown that the social benefits of higher education include lower public health costs (due to improved health literacy and better personal health habits), longer life (an additional 4.5 years in the United States for those completing a bachelor's degree), lower public incarceration costs, and greater contributions to productivity. See: https://www.tiaainstitute.org/public/pdf/institute/research/advancing_higher_education/ahe_privatesocial0310c.pdf

cities and lack of social cohesion. (Banister & Berechman, 2001; Demurger, 2001; Gakenheimer, 1999; Mu & Van de Walle, 2007)[35]

3.3 - Sustaining the environmental gains of development – focus on basic services

The inadequacy of "basic services", i.e, water, sanitation, hygiene, and electric power, is a common problem in poor countries and is a particular challenge for the poor. It also greatly influences the quality of the environment in which the poor live, with effects on productivity and health.[36]

For many poor countries reliant on the primary sector, city life means low-end housing, education and healthcare, and a polluted urban environment as a result of inadequate access to clean water and sanitation, inefficient waste burning, etc. Without addressing these issues, the development of transport corridors with the accompanying growth of manufacturing industry can degrade the environment by adding to the existing sources of pollution. Sustainable corridor development implies sensible planning of infrastructure that focuses on converting city occupations into high value-added services and locating manufacturing away from residential areas.

As with the provision of education and healthcare, provision of basic services requires a strong public commitment. The construction of a corridor offers opportunities to mitigate the environmental consequences of pollutant generating activities related to basic services. For instance, landfills can be located at appropriate distances from water sources and human habitation, and waste collection becomes more economically viable and can replace waste-burning, especially in remote areas.

3.4 - Aligning economic, social and environmental gains

Aligning the three pillars of sustainable development as part of a corridor strategy offers the opportunity to economically address several hitherto intractable problems. Consider the problem of unregulated waste burning. Research shows that 41 percent of the world's total waste is disposed through unregulated burning, with major effects on health. (Wiedinmyer, Yokelson, & Gullett, 2014) This problem is intrinsically linked to poverty: poor countries cannot afford the facilities for proper waste disposal. Yet, some poor countries are finding innovative solutions. For instance, privatizing the disposal of waste has been found to reduce costs while improving efficiency, although, in the absence of strong compliance systems, the benefits are fewer. (Bel & Warner, 2008) Developing solutions around corridors, where the solutions can include optimizing landfill locations, providing services through collaborations of cities along a corridor, and applying best

[35] In rural Nepal, for example, easier access to roads appears to have benefited poor households but did not reduce income inequality. In rural Bangladesh, middle-income households rather than the poorest households benefited the most from investments in roads. On the other hand, pro-poor policies can help. For instance, transport improvements in Vietnam and Madagascar reduced inequality.

[36] https://www.theguardian.com/environment/2016/feb/12/air-pollution-deaths-india-china

practice regulations developed in more advanced locations along the corridor can lead to outcomes that enhance all the three pillars of sustainable development.

A second example: Tajikistan is a poor, landlocked, largely rural, and natural-disaster-prone country, with immense water resources. Through upgraded pipelines, roads and investment in hydroelectric generation, its hydroelectric potential can be realized through an economic corridor with China and other countries in the region. However, to make Tajikistan's development sustainable, policies should address economic, social and environmental issues. These include addressing disaster resilience, improving workforce skills, and improving connectivity between rural locations. By focusing on these aspects, a transport corridor can greatly improve the social and economic conditions of Tajikistan's population.

As these two examples show, corridor development and sustainable development can offer synergistic benefits if policy is aligned around the three pillars of economic, social and environmental progress.

4. Addressing Public Policy Challenges of Sustainable Development under BRI

In this section, we discuss a number of public policy challenges to sustainable development. These include identifying public goods for investment, regulation, and the role of the public sector as an investor.

To achieve sustainable outcomes, policymakers will need to think of FDI in public goods in a different way than has been done so far. The public goods suitable for BRI investment include, at least, physical infrastructure such as railroads and pollution controlling equipment. These are public goods in that they would likely not be financed by private sources of capital because the rate of private return may be below the cost of capital, even while the social rate of return may be high enough to justify the investment. FDI fills the gap between host country capacity and the capital needed.

In the BRI countries, public goods suitable for FDI should also include, under an expanded definition, investments in human capital improving services, such as health, formal education and workforce training. We have argued above that these are services that ensure that the gains to corridor development become sustainable. Yet, these are services that would be provided in sub-optimal amounts and quality levels if left to private capital, since the private rate of return, though positive, is likely to be below the cost of capital for high quality services, but above the cost of capital for low quality services.

The regulation of BRI investment will require addressing cross-border issues, such as differences in compliance standards, and dispute resolution mechanisms. For instance, a power plant will be more viable if the power is used to generate high value-added goods and services. In countries with weak enforcement standards, power produced may be stolen or used for low-end services. In several countries, the power distribution companies have not honored power purchase agreements with private IPPs due to the inability of government to ensure compliance with those agreements. The contrasting situation that of

regulatory capture by large producers, is also widely observed. Thus, setting the appropriate regulatory structure that incentivizes producers while protecting consumers from the monopoly profits inherent in natural monopolies is important.

To enable FDI in such services, the regulations should allow cross-border investment in services, as well as cross-border movements of service providers. These rules could be based on WTO standards.[37]

To ensure cross-border compatibility, standardized regulations for common resources such as capital and labor should be adopted through common rules on environmental protection, property rights and labor rights. Consumer rights should be protected by common pro-competition rules. A tribunal accepted by all BRI countries could resolve disputes.

For specific industries, since different countries have different organizational structures, e.g., the division of responsibilities between the provinces and the national government will likely not be the same across countries, it may be necessary to take a different approach. A model set of rules could be adopted, with the recommendation that actual rules be based on this model. For example, for power generation, regulations regarding tariff setting and production licenses could be addressed through negotiations among the affected states, based on a model set of rules earlier agreed upon.

A key feature of the projects under the BRI is the role of the public sector as an investor. This could include both the host state and overseas state-owned bodies. Since the investments may be in public goods, normal market principles may not be optimal. The state bodies should, to the extent possible, base their investment decisions on calculations of the social rate of return. The actual investment may take various forms, such as public guarantees for private investment, and joint investment with the private sector. In order to incentivize investment by the private sector, the public sector may also commit resources for complementary investments. For instance, a rail-link can be made more attractive to private investment if radial transport corridors are built at nodes along the railway line in order to transport goods to the nodes.

Complementary investment can also address 'ribbon development', a possible outcome of transport corridors.[38] This phenomenon arises when the government supports the building of the corridor between two nodes, but does little to stimulate growth in the areas away from the corridor. 'Ribbon development' means the development of infrastructure and services in a narrow area around a main transport corridor through private initiative. The state may even support private investment by concentrating public services along the ribbon. This can lead to the economic and social decline in areas (either rural or urban) located away from the corridor. Over time the remote areas can degrade due to rapid outmigration to areas within the ribbon, while increasing congestion along the ribbon. To address this issue, the state should, prior to building the corridor, account for the costs of supporting balanced development in the area through radial transport, electricity and other

[37] https://www.wto.org/english/tratop_e/serv_e/cbt_course_e/c1s3p1_e.htm
[38] Several developing countries have witnessed the problem of ribbon development.

infrastructure links, and build these costs into the corridor project. Some of these additional costs may have to be borne by the government.

5. Summary of Policy Priorities

Given the transformative ambitions of the Belt and Road Initiative, policy initiatives will need to display long-term thinking and creative design. In this section, we summarize the priorities (Looney, 1997) that policymakers should address in order to accomplish these ambitions. [39]

We discuss below the policy priorities in order of coverage, beginning with priorities that should be developed commonly for all the countries within BRI, and then down to specific priorities for locations and industries.

1. Supranational arrangements: The areas targeted for BRI-wide arrangements should cover those where cross-border compatibility will be needed and where well-defined standards can be developed. While a proper sequencing of reforms will be needed, the ultimate goal of such arrangements should be to devise rules based on best practice global standards, such as WTO standards for trade compliance and people movement, as well as create an independent, rules-based mechanism for compliance and dispute resolution. The priorities include the following:
    a. Regulations regarding property rights and labor rights.
    b. Compliance between environmental law and policymaking
    c. Pro-competition and other consumer protection rules.
    d. Regulations to permit cross-border investment in goods and provision of services with low transaction costs, including low tariff barriers.
    e. Design of investor–state, and state-state dispute settlement mechanisms with regard to environmental, labor rights, and property rights disputes.
2. Region-specific or bilateral arrangements: While many of the constraints to efficient delivery of goods and services may be addressed by supranational arrangements, the following priorities should be addressed bilaterally or regionally:
    a. Reducing specific tariff and non-tariff barriers. This particularly applies to non-tariff barriers, such as inspection regimes and could include reducing tariffs on environmental goods and services

[39] By 'policy priorities' we mean the goals of policymaking rather than the actual policies themselves.

b. Investment in trade facilitation services across borders, such as inland container depots, multi-mode transport services, and automation of service processes.

c. Cross-border tax neutralization, and related adjustments

3. Infrastructure-specific arrangements: These policies are intended to ensure adequacy of the physical infrastructure along the corridor. The policy goals should cover the following aspects.

    a. Facilitating movement of freight transport and flows of people through appropriate route planning and determining the types of infrastructure.

    b. Addressing the potential of hinterland multimodal networks through infrastructure designed to lower transportation costs and travel times, and to improve road access and proximity to markets from remote areas to nodal points along the corridor.

    c. Ensuring that corridors be designed to maximize access to health, education and workforce training services, and improved affordable housing, while helping to reduce inner-city congestion.

    d. Ensuring that corridors enable the conversion of city occupations from manufacturing into high value-added services, including through zoning for providing the physical infrastructure to locate manufacturing away from residential areas.

    e. Development of green transport corridors in the BRI context as an integrated low-carbon and long term sustainable transport concept (use of green strategies, technologies, environmental effectiveness of operations, use of different transport modes (co-modality) and supply chain constitution, link between environmental and spatial planning and social aspects), and targeting whole-project life-cycle productivity

        i. Creating incentives for green investment financing in infrastructure.

        ii. Fostering green standards, disclosure and reporting on investment impacts.

        iii. Integrating (renewable) energy sensitive measures such as Renewable Portfolio Standard (RPS) mandate to electricity producers, etc.

4. Country-specific/National arrangements: The policy goal should be to establish high business standards. These should include the following.

    a. Best practice standards of compliance and transparency in trade, banking, and business processes.

b. Encouraging SME formation through policies that increase the ease of doing business by SMEs. This should be accomplished through rules that reduce the cost of new business formation and closure, contract enforcement and related rules.

    i. Encouraging capacity building programs for the sustainable inclusion of SMEs in GVCs in an inclusive business ecosystem.

c. Ensuring that public sector investment and other support, such as risk guarantees, focus on public goods, such as complementary investments that will attract private capital, and that will address the challenge of ribbon development.

5. Industry-specific arrangements: The policy goal should be to create standards that adapt to country specific differences, such as governance structures.

    a. Developing industry-specific model rules could be adopted. Actual rules should be based on and adapted from this model. For example, for power generation, regulations regarding tariff setting and generation licenses in practice could be negotiated among the affected states based on a model set of rules earlier agreed upon.

    b. Comprehensive environmental risk analysis should be achieved by integrating the environmental sustainability into industrial arrangements

Table 1 - Summary of Policy Priorities

Implementation Authority	Policy Priority
Supranational	Property rights
	Labor rights
	Environmental laws
	Consumer protection
	Cross-border investment
	Dispute settlement
Regional and Bilateral	Tariff and non-tariff barriers
	Trade facilitation services
	Cross-border tax neutralization
Infrastructure	Corridor route planning
	Hinterland infrastructure
	Access to health and education services