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Evaluation of transport corridor effects on sustainability: Kazakhstan case study

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ABSTRACT

This research aimed to identify the implementation level of Task 9.1 (Sustainable Development Goal 9) in the Republic of Kazakhstan. The literature review under this study also allowed as-sessing the degree to which the transport corridors impact the sustainable development of the Central Asian Region. In addition, 97 companies were surveyed and 51 extended interviews were conducted as part of the CILT Central Asia Project to assess the effects of transport corridors on businesses. The study has revealed significant gaps in the SDG9 data collection system, specifically, the need to integrate indicators on the impacts of building new infrastructure in the infor-mation collection system for SDG9 evaluation.

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1. Introduction

Advancing its policy on the reunification of Asian states, China has pushed them to develop international transport corridors (Cariou, 2018). Prior to launching construction projects, experts conduct preliminary assessments. Firstly, it is assumed that such corridors allow reducing the number of traffic accidents, as well as the associated losses and damage. Secondly, such corridors are considered to positively affect population mobility, with the aim of enhancing their wellbeing and social status. Thirdly, international transport corridors stimulate trade flows inside a region and, as a consequence, its overall economic development (UNECE, 2015). The issue of sustainability of transportation infrastructure is particularly relevant for emerging economies (Tucho, 2022).

Although transport is not subject of a specific Sustainable Development Goal (SDG), the sector is relevant to all seventeen (17) SDGs (Mantlana et al., 2020). It likewise has special significance in the context of SDG9 (Task 9.1) related to the development of high-quality, reliable and sustainable infrastructure capable of meeting the basic needs of people to move.

From the point of view of sustainable development, the main tasks in the transport sector should be improving the quality of roads; expanding and upgrading railway infrastructure in landlocked countries; and establishing regional links (ADB, 2021). However, it is not possible to assess the success in implementing these objectives without proper data collection systems (ADB, 2022).

Harvesting transport/transportation data provides information on the progress in achieving the UN SDG priorities. Systematic gathering of target data and information is particularly important for landlocked countries (WB, 2014), as they are forced to pursue alternative options, for instance, building dry ports and transit corridors through their territories, etc.

The Central Asian (CA) countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) – historically considered the Silk Way (SW) Region – are participating in China's Belt and Road Initiative (BRI) (Sternberg et al., 2017). Using the BRI project means, the CA states have been actively developing their transit (China to Europe) potential.

In recent years, against the backdrop of shrinking maritime traffic, railway transportation has been expanding. However, with the increasing cargo turnover along the main sections of the route (China-Europe-China), its regional sections (China-Kazakhstan, Kyrgyzstan; China- Kazakhstan-Russia) have experienced the "bottleneck effect" due to the growing land cargo container flows between China and Europe in and out of the Central Asian Region (CAR). In April 2021, the chief economist at the Central Asia Regional Economic Cooperation (CAREC) Institute warned that CA countries involved in the BRI should prepare their land transport to handle the challenges of bidirectional trade between China and Europe (Yilmaz et al., 2018).

While freight trains shipping from China to Europe have the priority pass and cross Kazakhstan's border easily, the cargo from Kazakhstan to China gets moved aside to the waiting zone creating kilometer-long queues. Paradoxically, the national economy – which is based on the mining industry – has already incurred multimillion dollar losses due to the priority for transit trains.

In addition, the chaos in car and railway shipping from mid-2020 faced multiple enterprises with direct losses because of cancelled contracts. For example, the losses of railway cart owners amounted to USD18.6 mln, while cargo senders and receivers lost up to USD395.3 mln. Taking into account the growing transit railway flows from China, it is vital to assess the possibilities for enhancing regional connectivity (Satubaldina, 2022).

2. Methodology

As an efficient research tool, the study's initial stage included a systematic review of literature. To answer Research Question (RQ) 1 "To what extent do the international corridors established in the Central Asian Region fulfil the region's development function?" Google Scholar and Science Direct databases were utilized via keyword search ("logistic corridor", "regional logistics", and "infrastructure impact"). Since this study and paper focus on the current situation in the Central Asian regional logistics market, the keywords "CA region" and "CA regional logistics" were also added to the search.

The database structured around the results of surveying 97 companies and conducting 51 extended interviews was created at the second stage of the research (CILT International & CILT Kazakhstan prepared the database for the World Bank). Initially, it was planned to survey 250 companies, but time constraints and unapproachability of largescale national companies, i.e. their disagreement to disclose information, cut the number of target business entities to 97.

The study's third stage focused on answering RQ2 "How do the established corridors influence businesses?", mainly via the following interview questions (IQ):

• RQ21 – "Is there a split between domestic and international trade flows?"

• RQ22 – "Has the infrastructure built in CA reduced transport costs and attracted trade flows associated with business development?"

• RQ23 – "Has the situation with COVID-19 (from March 2020) affected business operations?"

In order to answer the Research Questions, all Interview Questions were grouped into blocks (see, Fig. 1.).
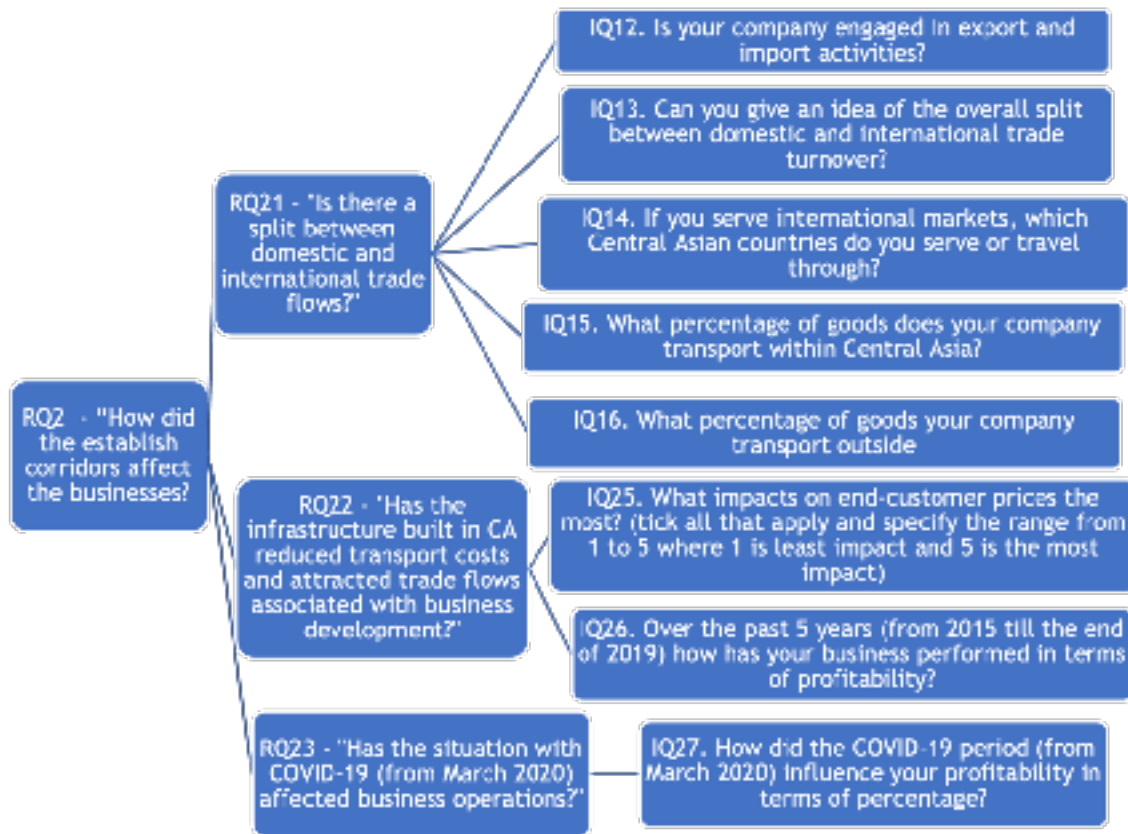
Figure 1. Links among interview questions and research questions
(developed by authors based on interview data)

3. Result analysis

Literature review results

Scholars worldwide indicate that transport corridors play a crucial role in facilitating regional development. Country-specific data collection and analytical efforts are based on existing data management practices and are geared towards the corresponding state strategies, with their extent and systematicity dependent on the state budget. Kazakhstan has been through a series of changes in terms of data collection tiers, yet overall its statistics database still requires improvement.

The first tier of data collection in Kazakhstan aims to gather information from the participants of foreign economic activities, answering "who?", "where?", "what?" and "how much?" questions, thus reflecting the strategic level. The second – tactical tier focuses on reliability, quality, and safety indicators (road length, traffic density, safety, etc.). Transport data from industry databases (e.g. number of obtained transportation licenses, etc.) are not transmitted to statistics authorities. Thirdtier data describing customer satisfaction with the transport industry performance based

on systemic feedback gathered via participant surveys are missing altogether.

Receiving unreliable information, decision-makers lack motivation to address the issues inside the transport sector. The regional trade imbalance exacerbates the situation even further. These foster the increase, rather than the decrease, in costs, which should otherwise be the main task of building transport corridors (Kano, et al.,2020).

Transport corridor impacts are reflected in technical indicators on road quality, assessed differently in different countries. There exist international standards, including on the number of cracks per area unit; and internal standards (ex.: GOST) which countries design and apply domestically guided by temperature regimes, maximum level of projector strength, etc. More often, corridor impacts are reflected via technical indicators on safety in traffic accidents measured according to the international method, i.e. number of accidents per population or area unit, comprising a detailed analysis of traffic accident causes laying the foundation for prevention actions plan. These indicators are used for pre-project evaluations to justify the effects which may occur after a corridor reconstruction.

The economic impact indicators do not account for flow connections, as there are no schemes for collecting such data regarding a given corridor. However, a challenge of gathering statistics arises – inaccurate official statistics may lead to overestimations.

Expert interview results

RQ21. "Is there a split between domestic and international trade flows?"

All interviewees were divided into categories, with each interviewee given a unique name indicating job position, occupation, and company's status (international or local). Such disaggregation enabled a more structured data presentation (see, Fig. 2.).

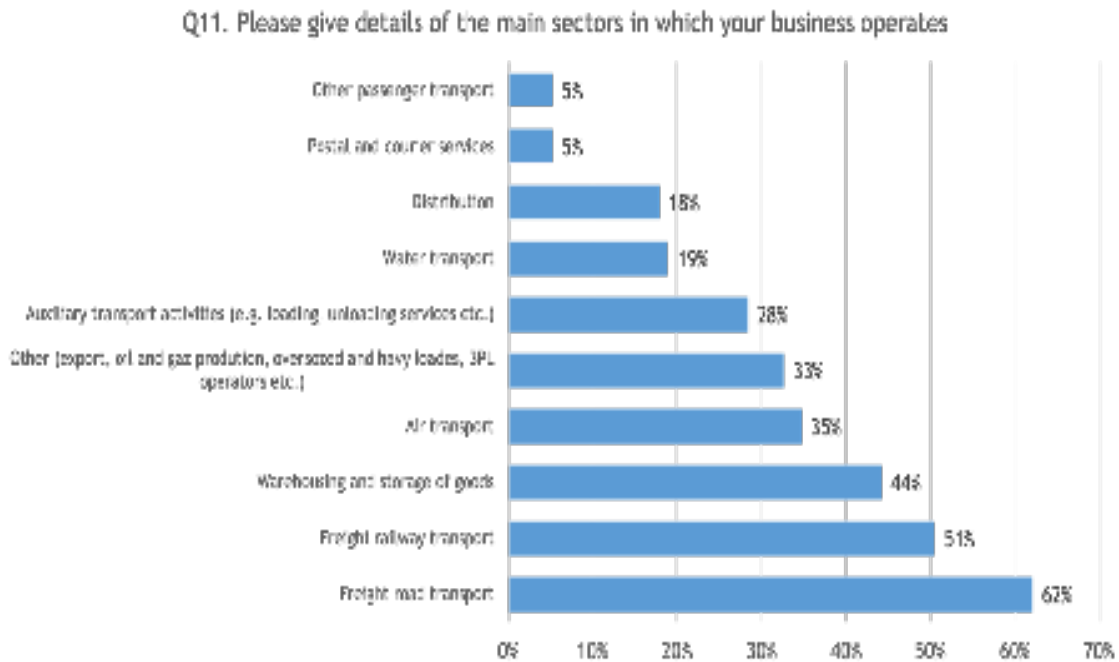Q11. Please give details of the main sectors in which your business operates

Figure 2. Interviewee positions and levels
(developed by authors based on interview data)

Large enterprises have been shifting to road freight as an alternative to railway shipping. However, the roads are in bad condition. For example, an interviewee reported that "[f]or our customers and therefore for us, rural roads and roads to remote industrial facilities [are important]. Unfortunately, these roads are often in poor condition or simply absent. We consider the main highways in Kazakhstan to be satisfactory. We are ready to pay moderate fees for toll roads, if their quality meets high standards".

RQ21. "Has the infrastructure built in CA reduced transport costs and attracted trade flows associated with business development?"

The increasing prices for road freight forced many companies to switch to other transportation types. An [D, I, Exp] interviewee reported that "… [t]he direction towards Taraz and Kyrgyzstan has changed. The Kyrgyz buyers have completely switched from rail to road transport".

According to the survey respondents, customer requirements for fast delivery represent the most significant (4 points out of 5 possible) share of transportation costs (see, Table I).

Table I. Factors influencing freight costs (developed by authors based on interview data)

Indicator	Average score (1-5)
Customer requirements for fast delivery	4.4
Routing	3.6
Variables in pricing due to using third-party logistics providers	3.5
Driver hours	3
Border controls and time spent	2.9
Unpredictable congestion and traffic delays	2.8

The unsatisfactory conditions of roads in Kazakhstan hinder the development of regional connectivity along all corridors. However, the interviewees noted the positive change in the Western Europe-Western China Corridor and part of the CAREC Corridor connecting China and Central Asia. According to an [M, L, PL] interviewee, "[t]he Western Europe-Western China highway can be called the most convenient road". An [D, I, Exp] interviewee stated "[w]e note the positive dynamics in the Southern (Bishkek-Almaty-Khorgos) Corridor".

4. Discussion

The research has demonstrated the relevancy of investigation of international transport corridor impacts on the Central Asian Region's sustainable development. China's infrastructure boom (BRI Initiative/Project) has attracted special attention of scientists to this matter. Despite the fact that the corridor section passing through Kazakhstan was completed back in 2019, no studies describing its effects on CAR's sustainable development (RQ1) have been conducted so far.

The open online search executed within the framework of this study allowed pinpointing the main directions of related research efforts: quality of transport infrastructure, changes in trade relations, and development of regional capacities. The outcomes of expert interviews confirm the findings of the literature review.

The interviews conducted under the study have likewise shed light on the specific corridor impacts on businesses in Central Asia (RQ2). According to the respondents, the split between domestic and international trade flows (RQ21) in Kazakhstan amounted to 30/70, with the base cargo flow (85%) of total exports (crude oil, natural gas, uranium, metals) going to Europe (40%), China (17%), Russian (12%), and Central Asia (6%) by railway (CA to Russia and EU).

The imports (machinery, equipment, vehicles, devices, chemicals) going in the opposite direction come from Russia (42%), China (21%), Europe (15%), and Central Asia (4.2%). Thus, the raw material orientation remains the main factor constraining the overall development of the CAR, with the situation aggravated by the shaping transit flows, i.e. they merge with infrastructure, receive priority and restrain flows from/ to Central Asia. Searching for alternatives, large enterprises have been switching to road transportation along Russia-Kazakhstan and CA-Kazakhstan directions.

The poor condition of roads in Kazakhstan hinders the development of regional communications along all corridors, although the survey participants noted positive dynamics with respect to the Western Europe-Western China Corridor and CAREC section connecting China and CA.

During 2017-201, after the completion of the corridor, logistics companies noted an increase in business activity. The COVID-19 pandemic provoked the demand for land modes of transport, with the transportation requests not decreasing, but increasing several fold. The companies noted the positive changes associated with the opening of new regional markets (including Kyrgyzstan, Uzbekistan, Afghanistan, and Pakistan). However, the main factor influencing freight prices and transportation costs was stated to be customer requirements for fast delivery. Despite the increased delivery time (delays at border crossings), customers were forced to pay 3-4 times more.

Through literature review and expert interviews, the study allowed partially filling the knowledge gap on how the constructed transport corridors affect the business environment in the Central Asian Region. Nevertheless, certain limitations should be acknowledged. Of the large set of reviewed articles, only three (3) focused on the target region. It is also possible that certain sources/articles were missed due to the peculiarities of Google search engine rankings. The expert interviews were conducted in Kazakhstan, and thus may only reflect the country-specific situation. This research focused on the Central Asian Region as per the requirements of the corresponding World Bank activity, but the thematic investigation may be expanded within the framework of other projects.

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