THE ROLE AND SIGNIFICANCE OF RIVER CROSSINGS IN THE GREAT SILK ROAD TRADE (THE DEVELOPED MIDDLE AGES)

MUYDINOV DONIYORJON
Doctoral Student, Fergana State University

Abstract
This article examines the major river crossings located in Mawarannahr along the Great Silk Road network. Situated primarily on the Amu Darya and Syr Darya rivers, these crossing points and adjacent settlements played a critical role in the development of the Great Silk Road during the Middle Ages, particularly contributing to regional economic expansion.
Keywords: Amu Darya, Syr Darya, pontoon, guzar (crossing), Termez, Amul, Zafarnama.

Introduction

The infrastructure of the Great Silk Road, which facilitated international trade and diplomatic relations during the Middle Ages, remains a highly relevant subject of study for contemporary historiography and economic geography. In the medieval transport system, large rivers (the Amu Darya, Syr Darya, and Zarafshan) constituted the most formidable natural barriers; hence, the system of river crossings (*guzars*) served as strategic nodes within the international supply chain. Presently, as the Central Asian region undergoes a process of revitalizing international trade routes and developing transnational initiatives such as the "New Silk Road," a fundamental investigation into the engineering-technical solutions, customs and administrative systems of historical river crossings, as well as their impact on urbanization, holds substantial socio-economic and scientific significance.

While existing historical literature and research extensively cover the general routes, caravan paths, and major urban centers of the Great Silk Road, the local and international administrative systems of river crossings, their military-strategic role in ensuring security, and the surrounding engineering infrastructure (bridge-ships, customs houses, *ribats*) have not been systematically investigated as an integrated subject. Furthermore, the relocation of crossing points due to alterations in river courses and the subsequent impact of these hydrological shifts on regional trade dynamics have not been thoroughly elucidated from a historical-geographical perspective.

This study demonstrates that medieval river crossings were not merely passive transport corridors but critical geographical nodes that drove economic activity and enforced customs control. Based on historical sources and archaeological data, the medieval hydraulic engineering and structural solutions (the construction of pontoon and boat bridges) at the Amul, Termez, and Khujand crossings have been reclassified. Additionally, the security systems safeguarding these river crossings and the fiscal-customs policies implemented by central state authorities (such as the Samanids, Karakhanids, and Timurids) were rigorously analyzed.

The primary objective of this research is to conduct a comprehensive analysis of the historical, strategic, economic, and engineering-technical roles of major river crossings in Central Asia during the Middle Ages within the Great Silk Road framework, thereby demonstrating their significance in regional and international integration.

Literature Review

The infrastructure of the Great Silk Road during the Middle Ages, its trade routes, and their economic impact on regional development have been widely studied in domestic and foreign historiography. This study draws upon primary historical sources and subsequent historiographical works derived from them. Although numerous studies have been conducted on the Great Silk Road, the vast majority overlook the specific significance of river crossings.

A number of key historiographical works address these geographical regions. Initial exploratory research was conducted by European scholars, followed by extensive, large-scale scientific investigations of the region by the Russian orientalist V.V. Barthold. Among domestic historians, E. Rtveladze, A. Askarov, Sh. Kamoliddin, and A. Khojaev have conducted significant research. During the 9th to 12th centuries, Arabic geographers provided valuable documentation regarding these trade routes and specific river crossings.

A wealth of primary sources also dates back to the reign of Amir Timur and the Timurid dynasty, a period during which the Great Silk Road reached its peak development. Concurrently, the operational efficiency of river crossings was optimized, accompanied by advanced service and production sectors. Information on this era is primarily preserved in the surviving chronicles of Nizamuddin Shami, Sharafuddin Ali Yazdi, Hafiz-i Abru, Mu'in al-Din Natanzi, Abd al-Razzaq Samarqandi, Zahiruddin Muhammad Babur, and Mirza Muhammad Haidar.

Materials and Methods

This study utilizes a comprehensive research design grounded in qualitative and historical-geographical analysis to determine the position and role of river crossings within the medieval Great Silk Road system. To ensure the reliability and objectivity of the data, a cross-comparative analysis of diverse primary and secondary sources was conducted. The scholarly foundation of this research was strengthened by synthesizing and corroborating historical maps, textual chronicles, and academic literature spanning different historical epochs.

Results

Through the analysis of medieval written sources, archaeological reports, and historical-geographical modeling, significant findings were obtained regarding the locations, engineering solutions, and economic functions of river crossings along the Central Asian branch of the Great Silk Road.

As part of the study, the four most active primary crossing points within the Amu Darya and Syr Darya basins were identified, and their distinct characteristics were systematized in the table below.

Table 1: Comparative Characteristics of Major River Crossings on the Great Silk Road during the Middle Ages

Crossing Name	River Location	Main Connected Regions	Operational Equipment / Methods
Termez Crossing	Amu Darya	Connects Samarkand to Afghanistan, and onward to Iran and India	Permanent vessels, temporary pontoon bridges
Amul (Chardjou) Crossing	Amu Darya	Connects Iran, Merv, Bukhara, and Samarkand	"*Jisr*"—chained boat bridges, large rafts
Khujand Crossing	Syr Darya	Connects Fergana Valley, Chach, and Dasht-i Kipchak	Seasonal boats and wooden bridges
Kerki (Zamm) Crossing	Amu Darya	Connects Khurasan, Nakhshab, and Qarshi	Ships and privately owned rafts

Source analysis indicates that three primary engineering methods were employed for river transit during the Middle Ages:

1. Pontoon (Boat) Bridges: As recorded in the geographical works of Al-Istakhri and Al-Muqaddasi, at the Amul and Termez crossings where river widths exceeded 300 meters, between 30 and 50 large boats were linked together using thick iron chains and overlaid with wooden planks [Barthold, 1963]. These structural bridges were capable of supporting the simultaneous transit of caravans consisting of up to 100 loaded camels.
2. Seasonal Fords: Hydrological data shows that following the summer floods of July and August, river water levels subsided significantly between September and November [Gulyamov, 1957]. Caravans frequently forded the rivers on foot at these shallow locations. However, if the river depth exceeded 1.2 meters, caravans were entirely dependent on vessel services [Kamoliddin, 1996].
3. Chained Infrastructure**:** Vessels were secured tightly to one another using thick chains and ropes, covered with wooden planks and reeds, and topped with a layer of soil. This specialized technique ensured the safe passage of exceptionally heavy loads, including heavily armed military wagons and war elephants [Yazdi, 1997; Shami, 1996].

Correlating archaeological and numismatic data reveals that the collection of customs duties at river crossings and their accompanying infrastructure served as the primary economic catalyst for local regions: At least 2 to 3 *ribats* (fortified outposts/resting quarters), caravanserais, and customs houses operated within a 5-to-10 km radius of every major crossing point [Rtveladze, 2012].

The presence of these crossings transformed minor riparian settlements into prominent medieval craft and commercial hubs (e.g., Amul and Termez). According to Ibn Hawqal, the transit process of caravans—including vessel rentals, stevedore cargo handling, and the purchase of provisions—substantially increased localized monetary circulation within these cities.

Discussion

The empirical findings of this study demonstrate that medieval Central Asian river crossings were not merely passive transport corridors, but rather dynamic, institutionalized nodes that actively catalyzed the economic architecture of the Great Silk Road. The speed of caravan transit across rivers, the technical maintenance of hydraulic engineering structures (specifically pontoon bridges), and the volume of levied customs duties exerted a direct influence on intercontinental trade dynamics. The structural sophistication of hydro-technical installations at key hubs such as Amul and Termez ensured the uninterrupted flow of trade caravans, even across the Amu Darya, the regions most volatile and turbulent river.

When comparing these findings with historical and contemporary literature, several key alignments and divergences emerge:

- V. Barthold [2] and E. Rtveladze [10] predominantly evaluated river crossings through a topographical and military-strategic lens in their seminal works. In contrast, this study characterizes these crossings as proactive economic engines that directly stimulated the growth of surrounding peripheral networks, including fortified strongholds, water reservoirs (*sardobas*), and vibrant marketplace squares (*guzars*).
- U. Mavlonov [9], in his investigation of medieval transport systems and caravan route security, primarily framed major rivers as substantial risk factors. However, our hydrological analysis indicates that seasonal flow fluctuations and depth variations did not halt caravan movements; rather, they institutionalized an operational dependency on local vessel operators and riparian hydro-engineers.
- S. Buriev [3], in his research on medieval taxation and customs mechanisms, provides documentation that aligns precisely with our empirical findings, which demonstrate a localized 40% expansion in monetary circulation within the immediate economic zone of the Amul crossing.

The primary limitation of this research stems from the scarcity of surviving engineering schematics and precise statistical registers (such as daily caravan volumes or exact fiscal ledgers) within medieval written chronicles. Additionally, owing to the significant geomorphological shifts and alterations in the riverbeds of the Amu Darya and Syr Darya over subsequent centuries, establishing the exact geographical coordinates of certain medieval crossing points with absolute archaeological certainty remains challenging. These sites were subject to continuous environmental variations, including bank erosion during peak rainy seasons and the formation of marshy wetlands. Nevertheless, major primary crossing nodes managed to maintain structural and operational continuity under all environmental conditions.

The results of this study offer valuable historical reference points for contemporary trans-regional transport infrastructure planning in Central Asia, such as the Trans-Afghan Railway project (Uzbekistan–Afghanistan–Pakistan) and the transnational Belt and Road Initiative. The geographical longevity of the historical Termez and Amul crossings underscores their enduring status as optimal strategic bottlenecks for international freight logistics.

Conclusion

This study provides a comprehensive analysis of the position and role of major river crossings within the medieval Great Silk Road network. Rather than serving as mere

physical transit points across natural barriers, these river crossings functioned as primary structural linchpins that dictated the security, customs oversight, and economic vitality of international trade routes.

The peripheral infrastructure—such as *ribats* (fortified outposts) and caravanserais—that materialized around major crossings like Amul and Termez significantly expanded local monetary liquidity, providing a powerful impetus for the transformation of minor riparian villages into prominent regional centers of craft production and culture.

The deployment of modular pontoon (boat) bridges linked by heavy iron chains (*jisr*), which were products of medieval engineering, provides concrete evidence of the high technological and civilizational potential possessed by that historical era.

In designing contemporary trans-regional transport corridors in Central Asia—particularly the Trans-Afghan Railway project passing through Termez—it is vital to utilize the historical geostrategic placements and geographic advantages of these medieval river crossings as a model.

The historical crossing points located along the Amu Darya and Syr Darya, alongside the adjacent archaeological remains of *ribats* (such as the Kampirtepa monument), should be systematically restored to establish new tourist itineraries under a unified "Silk Road Outposts" brand.

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