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# New Silk Road infrastructure opportunities in developing tourism environment for residents better quality of life

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ABSTRACT

Residents' communities feature to make innovative tourism development strategies. Residents play an indispensable role in developing policies and sustainable tourism infrastructure projects. A few research studies have sought to understand the animated influence of sustainable tourism opportunities on residents' life. The study examines how tourism opportunities enhance residents' quality of life in the context of the New Silk Road Initiative. The main objective of the current research study is to analyze the interplay of perceived impacts of New Silk Road tourism infrastructure development on local communities' perception of sustainable tourism development and perceived quality of life. Previous researches were focusing on sustainable tourism projects incorporated various approaches to describe the linkage between the chosen variables. This study built and tested a causal model that specified the direct and indirect interconnections of perceived tourism infrastructure, sustainable tourism development, and residents' perception of the quality of life. This study incorporated a self-administered questionnaire to collect data sets from Kazakhstan's residents. The findings indicated that both direct and indirect effects of the New Silk Road Initiative of tourism infrastructure exhibited significant and positive influence on residents' quality of life through residents' perceived sustainable tourism development. The results indicated that the New Silk Road Initiative for tourism infrastructure positively effects developing sustainable tourism opportunities, which, in turn, escalates residents' life quality. Besides, findings are useful in designing the promotions of sustainable tourism governance and residents' welfare under New Silk Road Infrastructural Projects. However, solely tourism infrastructure strategies cannot improve residents' quality of life. Economic, social, cultural, and environmental factors are vital to developing sustainable tourism at the destinations and need concentration to stimulate and ensure the positive impact of tourism infrastructure on specific beneficial outcomes. The findings' implications are useful in developing more infrastructure projects in Kazakhstan.

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## 1. Introduction

The conception of infrastructure development has received substantial attention from researchers in the tourism field (Kanwal et al., 2020; Seidahmetov et al., 2014; Wang et al., 2020). Infrastructure development is a leading antecedent for progressive tourism development, supporting society, the economy, and the environment (Kanwal et al., 2019). An earlier study claimed building infrastructure in developing countries promotes cultural tourism activities and international sporting events that attract a flow of tourists and increased economic benefits (Wang et al., 2020). The past studies stated that the infrastructure initiative aims to realize tourism business prospects by improving the tourist experiences, residents' standard of living, employment opportunities, the conservation of cultural and historical values, and natural landscapes (Bi et al., 2020; Kanwal et al., 2020; Shafiee et al., 2019; Wang et al., 2020). After determining its significance to improve the tourism industry's business opportunities, the entire idea has come in the main direction of the tourism context (Kanwal et al., 2020; Seidahmetov et al., 2014; Wang et al., 2020). Researchers conducted most of the studies to examine the impact of infrastructure development, taking into account the views of tourists, tour operators, and service providers, and staff involved in infrastructure construction facilities (Daye et al., 2019; Frey and George, 2010; Wong and Yip, 2004). A study by Daye et al. (2019) identified the different advantages related to tourism infrastructure initiatives (Daye et al., 2019). The study results specified that employees of tourism, public, and other business organizations claim that projects in the tourism infrastructure have beneficial impacts on communities.

Besides, Wong and Yip (2004) found that almost 70% of respondents recognized that their company was aware of the importance of taking appropriate environmental measures during the construction of infrastructural facilities in Hong Kong; however, they did not actively participate in the necessary changes (Wong and Yip, 2004). Research also has shown most customers mainly concerned about the price and function of the finished product, as well as whether it will deliver on time and followed the standards, but in construction processes, they not much focus on environmental principles. Similarly, another examined the perceptions of business entrepreneurs toward tourism initiatives (Frey and George, 2010). Despite the overall positive attitude towards such tourism programs, the results of the study indicated that entrepreneurs do not spend time and money to facilitate evolving issues related to tourism. The research also claimed that tourism initiatives costs such as high competitive atmosphere and perceived absence of government support are an obstacle to hold productive tourism initiative programs, particularly in a fast-growing economy. Numerous researchers conducted studies to understand the significance of infrastructure development and its impact on many outcomes. However, no reviews tested how the perception of tourism infrastructure affects residents' perception of sustainable tourism and the quality of life.

This concept is crucial because the positive impact of tourism infrastructure can only achieve the objective if the residents of these tourism destinations understand that activities related to infrastructure initiatives can create beneficial, sustainable tourism development and improve the quality of life (Andereck and Nyaupane, 2010; Nazneen et al., 2019; Sirgy, 2001). Notably, the prospects of China's New Silk Road Initiative of infrastructure development in Kazakhstan is an entirely new concept.

In 1994, the United Nations and World Trade Organization launched the "Program for Silk Road tourism." It is a well-known global travel program, which promoted tourism in Central Asia. In 2014, it expanded to the New Sea Silk Road tourism (Kantarci et al., 2014; Murton and Lord, 2020; Theobald, 2016). The primary objective of this tourism program is to contribute sustainable tourism along with the countries of Silk Road. As a creative network of destinations linked by a shared cultural heritage, Kazakhstan has positioned a major connection country along either ancient or New Silk Road, had excellent prospects to share its various common historical resources. Kazakhstan is rich with history and culture, where religious and cultural traditions have coexisted for centuries its nations. Possessing beauty, cultural and historical landscapes, Kazakhstan also has unique natural resources able to attract foreign and domestic tourists (Kirillova et al., 2020; Luz, 2020). Although there were real prerequisites for the development of Silk Road tourism in Kazakhstan, the country due to poor hospitality-related infrastructure has faced the challenge of building competitive tourism (Khadaroo and Seetanah, 2008).

Similarly, an earlier study identified several reasons for the underdeveloped infrastructure (Khadaroo and Seetanah, 2008). The research study established that the topography of Kazakhstan consists of large mountain regions, deserts, dry steppes, and small population density, making it extremely expensive and technically challenging to build modern infrastructure (Laruelle, 2018). Kazakhstan tourism market also was at risk of losing its domestic tourists. Thus, the Kazakhstan government has determined to take advantage of the opportunity offered by China's territorial expansion desire to invest, perhaps considering it to be the last chance for diversification and acceleration of infrastructure development. All previous efforts and programs have failed (Kassenova, 2017). New Silk Road infrastructure promotes cross-border tourism and trade benefits between member countries and regions. However, will the applications of the New Silk Road tourism infrastructure synchronized with what the United Nations and WTO are trying to do at hand? The present study carries out inclusive of local communities to support tourism growth via cooperative efforts in the context of the New Silk Road Initiative infrastructure to find a solution to the above argument. This issue is also touching on an international and domestic level in the research area.

Previous studies have rarely investigated attractive landscapes and cultural heritage in Kazakhstan, where tourism infrastructure development and tourism sustainability policies and implementation require more attention from the Government officials (Kirillova et al., 2020; Nazneen et al., 2019).

The remarkable visions in the field of the New Silk Road research recommended by the United Nations and WTO highlight the two main components of tourism products in Kazakhstan. Cultural tourism on the Silk Road (pilgrimage and traditional) and closely related to it eco-adventure tourism (safari, rafting, ornithological, trekking, mountaineering, hunting, fishing). In this regard, the officials have identified the regions, which have resources for eco-adventure and cultural tourism, through which the route runs Silk Road entire Kazakhstan. This route allows to tourist familiarity with the Kazakhstan 10 National Wildlife Reserves (Table 1), nomadic culture, the Meadville complex heritages, Shymkent (the "Holy Place"), the Turkestan, and Otrar ancient cities, and other exotic places, oasis, steppes. Turkestan and Otrar are the places of worship for such saints as "Arystan- Baba" and the "mausoleum of Khoja Ahmed Yasawi." On 13 July 2002, UNESCO acknowledged the World Heritage Site Mausoleum, and it was an available destination to the community as UNESCO Heritage. Besides, in 2015, the 38th UNESCO General Conference was included in the project to celebrate the 850th anniversary of the mausoleum to attract domestic and international tourists (Baitenov et al., 2019; Wagner et al., 2020). Thus, it is particularly interesting to appreciate locals' residents' impressions of the increase of tourism in the city area as part of the New Silk Route (Akbulaev and Bayramli, 2020; Garau-Vadell et al., 2018; Iovita et al., 2020).

The natural beauty and cultural exclusivity of the region annually attracts many domestic and foreign tourists, bringing a large amount of foreign currency into the country. Host communities via cooperative efforts in the context of the New Silk Road infrastructure play a vital role in promoting cultural tourism, increasing economic growth, encouraging more income for residents, and providing enhancements in local businesses (Abukari and Mwalyosi, 2020). Similarly, host communities' positive attitudes affect tourist satisfaction and their revisit to the destination (Aman et al., 2019). Devesa et al. (2010) described that it turns, as the cycle process will bring more benefits to the local community. Thus, examining the individuals' perception in the host community is vital for the development of infrastructure, sustainable tourism, and quality of life in the southern parts of Kazakhstan (Devesa et al., 2010). The host community in developed and developing countries differently treat towards sustainable tourism development. In some developing countries, the host communities demonstrated a welcoming attitude to domestic and international visitors, which effects on tourism productiveness.

Focusing these viewpoints maintains sustainable tourism and helps create a beneficial impact on local communities' living conditions. Table 2 and Fig. 1 below represents the list of World Heritage Sites in Kazakhstan as defined by UNESCO. Thus, this study will attempt to fill the existing gap with an analysis that provides an understanding of how residents in the southern part of Kazakhstan perceive New Silk Road infrastructure initiatives, which lead to formulating residents' perception of the quality of life. This research concentrates, in specific, on a framework such as the potential effects of tourism infrastructure on sustainable tourism development (Rogozhinsky, 2008; Winter 2019). Therefore, we proposed that residents' view of the New Silk Road tourism infrastructure initiative may positively influence their quality of life through the creation of positively perceived sustainable tourism in the region of Turkestan. If prospective relationships are helpful and maintained, the present study will expand and contributes to tourism literature that residents' perceptions regarding tourism infrastructure initiative are essential for the formation of their quality of life through positively perceived sustainable tourism development. Consequently, it is necessary to consider the residents' perceptions and drive the benefits of infrastructure development, particularly the residents' quality of life (Winter 2019).

The organization of the study proceeds as follows such way. Firstly, this study briefly elaborated on the theoretical background and hypotheses development of the paper. Secondly, the authors have described a detailed elaboration of the research method. Thirdly, the authors have presented different analysis methods and results of the study. Finally, this study showed the sections based on discussion, implications, limitations, and directions for future research.

**Table 1**
List of Nature reserves in Kazakhstan.

| Sr. # | Name | Location | Area of reserves | Year |
|---|---|---|---|---|
| 1 | Aksu-Jabagly State Nature Reserve | Turkestan and Jambyl regions | 131,934 | 1926 |
| 2 | Almaty State Nature Reserve | Almaty region | 71,700 | 1931 |
| 3 | Naurzum State Nature Reserve | Kostanay region | 191,381 | 1931 |
| 4 | Barsa-Kelme's State Nature Reserve | Kyzyl Orda region | 160,826 | 1939 |
| 5 | Korgalzhyn State Nature Reserve | Akmola and Karaganda regions | 543,171 | 1968 |
| 6 | Markakol State Nature Reserve | East Kazakhstan region | 102,979 | 1976 |
| 7 | Ustyurt State Nature Reserve | Mangystau region | 223,342 | 1984 |
| 8 | West Altai State Nature Reserve | East Kazakhstan region | 86,122 | 1992 |
| 9 | Alakol State Nature Reserve | Almaty and East Kazakhstan | 65,217,9 | 1998 |
| 10 | Karatau State Nature Reserve | Turkestan region | 34,300 | 2004 |

**Table 2**
The list of World Heritage Sites in Kazakhstan declared by UNESCO.

| Site | Location | Criteria | Year | Ranking | Description |
|---|---|---|---|---|---|
| Mausoleum of Khoja Ahmed Yasawi | City: Turkestan Region: Turkestan | Cultural: (i), (iii), (iv) | 2003 | 1103 | The Timurid era preserved Khoja Ahmed Yasawii mausoleum located in Turkestan (formerly Yasi), remains unfinished. However, it refers to one of the biggest and best-survived illustrations of Timurid architecture. |
| Petroglyphs within the Archaeological Landscape of Tamgaly | Nearest city: Alma-Ata Region: Almaty | Cultural: (iii) | 2004 | 1145 | Approximately 5,000 petroglyphs in Tamgaly indicate a lifestyle in the Central Asian steppes since the Bronze Age. |
| Saryarka – Steppe, and Lakes of Northern Kazakhstan | Regions: Akmola, Karaganda, Kostanay | Natural: (ix), (x) | 2008 | 1102 | State Nature Reserves Naurzum and Korgalzhyn offer wildlife sanctuaries for a multitude of threatened species, such as Siberian white cranes, Dalmatian pelicans, Pallas eagles, and antelopes Saigas. |
| Silk Roads: the Routes Network of Chang'an-Tianshan Corridor* | Regions: Almaty, Zhambyl (Together with China and Kyrgyzstan) | Cultural: (ii), (iii), (v), (vi) | 2014 | 1442 | A 5000-km section of the Silk Road, the stretch expended from Chang'an in China to Zhetysu in Kazakhstan. There are historical settlements, palaces, temples, walkways, fortifications, tombs, and other ancient constructions |
| Western Tien-Shan* | Regions: Turkestan, Zhambyl (Together with Uzbekistan and Kyrgyzstan) | Natural: (x) | 2016 | 1490 | The western part of the Tien Shan mountain system characterized by a variety of landscapes and a high degree of biodiversity. |

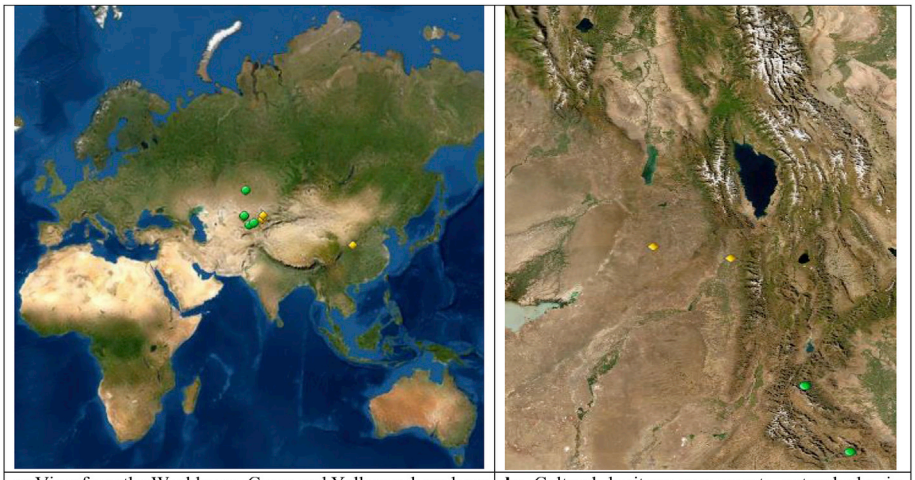
***Note***: Criteria as determined by the World Heritage Committee (Rogozhinsky, 2008; Winter 2019).

## 2. Literature review

### *2.1. New Silk Road tourism infrastructure and residents' quality of life*

The ancient Silk Road, a route of integration, exchange, and dialogue for almost two millennia and, made a significant contribution to the overall prosperity and development of humankind. For this reason, in 2013, the Chinese Government called for developing a new regional cooperation model during a visit to Kazakhstan through the joint construction of the "New Silk Road Initiative" projects to promoted income opportunities through the New Silk Road schemes. The initiative is China's massive international economic megaproject. It aims to encourage socio-economic development in joint countries, which is considered for sixty-four percent of the global population and thirty percent of world GDP (Huang, 2016). The initiative supports massive capital expenditures spends billion dollars for infrastructure development of NSR and presents opportunities to redress the constant problems associated with expanding the infrastructure. See Fig. 2 below.

The New Silk Road has an investment in roads, rail network construction, and the renovation of infrastructures such as energy, water, electricity, and power. Thus, the New Silk Road infrastructural project is promoting approaches for cultural tourism development to revive and offer a new sense to the journey that could improve the manner of living and the traveling attitudes (Koh and Kwok, 2017). It means, consuming a diverse historical and cultural heritage and wealth natural tourist



**a:** View from the World map. Green and Yellow colors show Natural Heritage mountain reserves in Kazakhstan

**b:** Cultural heritage monuments petroglyphs in Kazakhstan

**Note:** World Heritage Sites in Kazakhstan (source: UNESCO (UNESCO, 8 August 2016) )

**Fig. 1.** Tourism sites in Kazakhstan
**Note**. World Heritage Sites in Kazakhstan (Rogozhinsky, 2008; Winter 2019).


**Note.** Western Tien-Shan destination: World Heritage Sites in Kazakhstan. Source: UNESCO (UNESCO, 8 August 2016)

**Fig. 2.** Tourism sites in Kazakhstan – One Belt One Road Initiative
**Note**. Western Tien-Shan destination: World Heritage Sites in Kazakhstan. (Rogozhinsky, 2008; Winter 2019).

attractions that stretch along thousands of miles of ancient roads, the New Silk Road allows visitors the way to discover and enjoy a unique network of routes linked by a shared history. From the announcement of the New Silk Road initiative, Kazakhstan has attracted a multitude of tourists to visit a year and has had an economic influence on the country. The number of foreign tourists' arriving at Kazakhstan in 2017 reached 4,559,500, which amounts to 3077.5 million US dollars or 1.6 percent of the world GDP (Crotti and Misrahi, 2017). The production of tourism provides 150,585 jobs or 1.7 percent of the country's workforce. The state's focus on infrastructure development is the creation of six tourist attractions that suggest the region will continue producing favorable results on the competitiveness index for tourism, rising from 85th in 2015 to 81st in 2017. There is a well-established beneficial relationship between New Silk Road tourism infrastructural and demand in the tourism sector. With the development of tourism infrastructure, Kazakhstan host communities' in tourism areas may perceive that visitors consume local products and use services that can generate more revenue opportunities. Kazakhstani community' culture consists of a combination of Eastern (Turk nomads) and Western (Soviet Union impacts on culture, language and literature) ideology, Islamic (religion), and Turk (language) philosophy, which may have similarity opinion and standard views with tourists, alongside, being as unique. Therefore, the interference of local authorities and the positive attitudes of local peoples on tourism development considerably will be different. Tourism infrastructure development is mostly achieved utilizing new natural resources generates a business atmosphere in tourism destination, where residents have a beneficial reputation. Host communities' positive attitudes affect tourist experience and increase demand for a competitive tourism destination. Uysal et al. (2016) found that tourism activities and tourist experience contribute a positive impact in various life spheres, including family, social, leisure, and cultural life. Therefore, we may assume that the New Silk Road tourism infrastructure development at the destination may positively influence to enhance residents' perception of the quality of life (Uysal et al., 2016).

### 2.2. The impact of infrastructure development on tourism sustainability

Scholars have defined the concept of tourism infrastructure as the source chain of collaborating transport, social and environmental foundations at the regional level to create an attractive tourist destination and support local communities' interests (Erdogan, 2020; Jamal and Stronza, 2009). In Kazakhstan, tourism infrastructure initiatives consider it a plan for tourism management that involves strategy, production, organization, and business opportunities to ensure favorable economic, social, cultural, and environmental influences (Abubakirova et al., 2016; Seidahmetov et al., 2014). Kanwal et al. (2019) suggested that infrastructure development is expected to provide local communities with a better quality of life through employment and education benefits and (Grundey, 2008; Kanwal et al., 2020; Khan et al., 2020; Musavengane and Kloppers, 2020) enhance the natural and environmental resources management. Numerous studies described that tourism infrastructure uses available destination resources as the basis for tourism growth, which may a significant influence on the economy, society, and environment, and further stated during the in business activity and management local communities are responsible for their action. Adapting the above report for this research, we described the perceived tourism infrastructure as an assessment of residents' living in tourist areas (Grundey, 2008; Kanwal et al., 2020; Khan et al., 2020; Musavengane and Kloppers, 2020). To some degree, we believe that the actors engaged in tourism projects are responsible for observing social and sustainability standards the tourism planning and actions.

In short, the concept of effective infrastructure management relies on an insight into related community participation in taking commitment, responsibility, and understanding, which may help to build sustainability in tourism destinations (Shafiee et al., 2019; Wang et al., 2020). Previous studies specified that the capability of an area to attract people and businesses sustainably refers to existing infrastructure (Bi et al., 2020; Shafiee et al., 2019; Wang et al., 2020). Besides Kavaliauskė and Kočytė (2014) asserted that developing sustainable tourism, especially in rural locations, requires infrastructure action to serve the local population and the temporary population arriving for business or leisure purposes (Kavaliauskė and Kočytė, 2014). It shows that infrastructure development is a fundamental function of sustainable tourism (Khadaroo and Seetanah, 2008; Liu et al., 2020). A study conducted by Byrd (2007) narrated that building locals' cooperation in the development process, in which local communities assume responsibility action for the development of tourism within their community that is a pivotal factor to make tourism more sustainable. It explains that when resident responsibility to protect tourism destination, it results in a favorable action, and then it is named sustainable operation (Byrd, 2007). Generally, infrastructure development touches on the abovementioned sustainable tourism discussion, which infrastructure is more an indicator for the definition of sustainable tourism, for the reason that it acts sustainably. Therefore, we could infer that whenever community members perceive that infrastructure projects build based on adequate sustainability approaches and practices, then it will be the outcome of sufficient behaviors and actions, named sustainable behaviors and actions (Kavaliauskė and Kočytė, 2014).

The relation between perceived infrastructure development and sustainable tourism could confirm mostly from the established objects of careful planning of infrastructure and cooperation among residents. It provides a platform to reduce the adverse economic, social, cultural, and environmental effects at the same time as optimizing the positive influences of tourism development (Chang, 2019; Kanwal et al., 2020; Kim et al., 2013; Makuvaza, 2018; Nazneen et al., 2019). Sustainable tourism suggests that a fourfold or triple practical process comprises of an economic, social and environmental segment that offers an optimal solution in which there is a balance between all three dimensions (Choi and Sirakaya, 2006). A study on the impacts of tourism infrastructure in Kazakhstan has continuously demonstrated tourism infrastructure plays a vital role in achieving sustainable development of tourism (Khadaroo and Seetanah, 2008; Liu et al., 2020). Ashley and Roe (2010) conducted a study and explained that assuming significant benefits from tourism development strategies. They named it a "pro-poor tourism" strategy (Ashley and Roe, 2010).

Tolkach and King (2015) opined that community-based tourism projects in the construction of infrastructure in the rural Timor-Leste and neighboring areas promoted sustainability in the tourism sites (Tolkach and King, 2015). Previous studies have also cited the agreement between community members that the development of tourism infrastructure will eventually improve the economic stability of the society and be a predictor of the tourism sector's success and sustainability (Almeida-García et al., 2016; Látková and Vogt, 2011). Likewise, other different studies supposed that investment in infrastructure positively contributes to achieving the economic, social, cultural, and environmentally sustainable development in tourist attractions areas. (Fu et al., 2020; Greiner, 2010; Kavaliauskė and Kočytė, 2014). Numerous studies stated that tourism infrastructure approaches are directly at bringing favorable transport, environmental, and social impacts (Abukari and Mwalyosi, 2020; Bi et al., 2020; Mathew and Sreejesh, 2017; Shafiee et al., 2019; Sukiman et al., 2013).

### 2.3. The impact of tourism sustainability on residents' quality of life

Sustainable tourism addresses the needs of current visitors and the residents in tourism sites, protecting natural recourse, and enhancing opportunities for future perspectives. Byrd (2007) described that it requires local communities' cooperation, which provides future generations with sufficient resources to maintain a better quality of life (Byrd, 2007). In a study, Andereck et al. (2007) reveal that all resource management needs to carry out in a way while meeting the economic, social, and cultural needs of people, it is necessary to maintain cultural heritage, critical life support systems and responsibility for the environment. Thus, we may assume that sustainable tourism refers to a considerable determinant providing the essential solution for quality of life (Andereck et al., 2007). Quality of life is the level of well-being and happiness felt by the individual

or the community as a whole. According to the literature, the overall quality of life shows a functional relation to personal satisfaction within a culture value or life positions such as goals, expectancy, relationships. It consisted of four aspects: material well-being, social well-being, psychological well-being, and well-being for physical health and safety (Andereck and Nyaupane, 2010; Murton and Lord, 2020; Sirgy, 2001; Uysal et al., 2016; Woo et al., 2016).

Sustainable tourism induced by infrastructure development can have an immense influence on the quality of life of the local community. The study of Kim et al. (2013) and others investigated perception among Virginia residents. Besides, the study revealed that the community perception of tourism effects indicated an active association with their satisfaction with individual life spheres (Chang, 2019; Kanwal et al., 2020; Kim et al., 2013; Makuvaza, 2018; Nazneen et al., 2019)**.** Numerous researchers in the tourism literature have established that the impact of tourism concentrate on four main factors, including economic, social, environmental, and cultural, which have a significant effect on the quality of life of the local community (Choi and Sirakaya, 2006; Fu et al., 2020; López et al., 2018; Read, 2013; Woo et al., 2016). The literature evidenced that sustainable tourism continuously associated with local people. Concretely, it points out that tourism sustainability has a vital impact on the lives of the local community (Bi et al., 2020; Fu et al., 2020; Godfrey, 1998; Simpson, 2001; Woo et al., 2016).

The study of Puczkó and Smith (2011) specified that tourism development improves the quality of life. The study identified that the Gold Coast residents a strong agreement that their quality of life of residents associated with enhancing the standard of facilities such as recreational, shopping, and service (Puczkó and Smith, 2011). Recently, studies showed that infrastructure through employment and education benefits increased China's and Pakistan residents' quality of life. Tourism development is a viable tool for improving the communities' quality of life in rural areas (Andereck and Nyaupane, 2010; Kanwal et al., 2019; Uysal et al., 2016). When residents feel that resource costs and development are driving tourism, and their benefits are exacerbated, they may feel anger and annoyance at tourists. It leads to residents' dissatisfaction, which declines tourism (Brown, 2015; Ko and Stewart, 2002; Woo et al., 2015, 2016). It explains that local community perception of tourism development outcomes may influence the degree of their understanding of the quality of life. According to a study, governments' development of tourism, which occurs without residents' participation, is the dominant factor affecting the negative attitude of communities to tourism (Choi and Murray, 2010).

Lessons from effectively managing and the building of the New Silk Road tourism infrastructure inferred that enhanced access to communication and market opportunities, as well as host societies' responsibility, ensure sustainable tourism and ultimately improve Kazakhstan's both individuals and community prosperity at large.

It is worth noting that the tourism infrastructure and natural resources of the New Silk Road are interrelated. The mutual relations and the development of infrastructure affect natural resources and the economic, social, environmental, and cultural sustainability of the region. It ultimately improves the residents' quality of life. Therefore, sustainable tourism may have a positive impact on local life and business activities, because the development of sustainable tourism infrastructure is the result of the development of tourism infrastructure. It continuously attracts tourists to destinations and enjoys the local environment, culture, and society.

It is remarkable to note that the New Silk Road tourism infrastructure and the natural resources are interlinked, interrelation and infrastructure development affects the natural resources by affecting the sustainability of the economic, social, environmental, and culture in the area, which eventually increases residents' quality of life. Therefore, sustainable tourism may have a positive impact on the local life sphere and business activity, as it is outcomes of the tourism infrastructure development, which continually attracts tourists to visit the destination and enjoy the local environment, culture, and society.

## 3. Conceptual framework

The present study proposed a conceptual model and utilized the PROCESS method to assess the influences of residents' perception of tourism infrastructure on the formulation of quality of life through sustainable tourism development. PROCESS technique for regression analysis is widely applied to model or analyze data in social science research (Hayes, 2017; Leeflang et al., 2018). The majority of researchers practice it to understand the correlation between the direct and indirect variables, which is applicable to predict the accurate results. In this study, the proposed research model contains a dependent variable, namely factors of New Silk Road tourism infrastructure, and mediation variable called sustainable tourism development and the outcome variable, named quality of life. Fig. 3 below demonstrated the conceptual model of the present study, and it

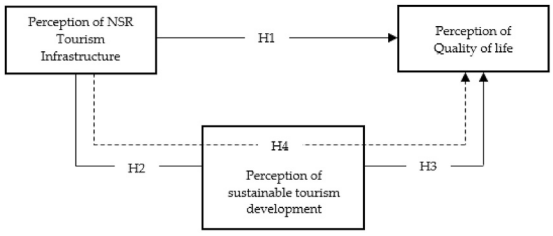



**Fig. 3.** The conceptual framework of the study.
**Note.** The proposed model with selected variables.

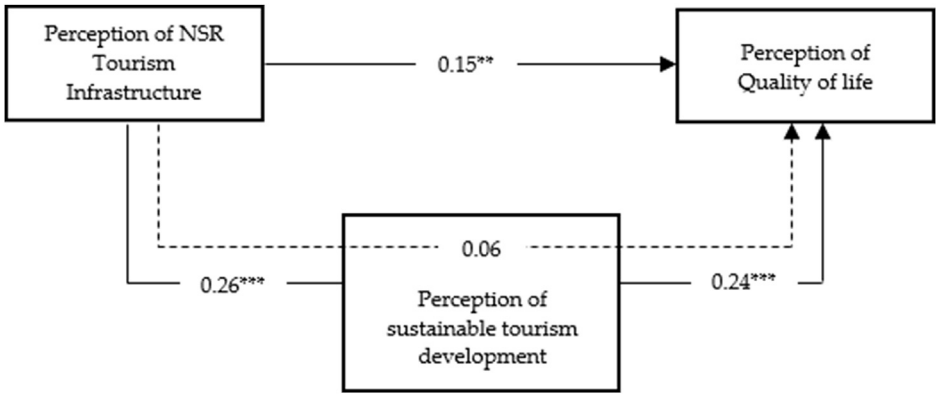



**Fig. 4.** Results of regression-based analysis.

displays the relationships between the designated variables (dependent variable, mediation variable, and independent variable) (see Fig. 4).

### *3.1. The hypothesis of the study*

**Hypothesis 1**. There is a positive relationship between residents' perception of the New Silk Road tourism infrastructure and their perception of the quality of life.

**Hypothesis 2**. There is a positive relationship between the residents' perception of the New Silk Road tourism infrastructure and perceived sustainable tourism development.

**Hypothesis 3**. There is a positive relationship between the residents' perceived sustainable tourism development and their perception of the quality of life.

**Hypothesis 4**. Perceived sustainable tourism development mediates between residents' perception of New Silk Road tourism infrastructure development and their perception of the quality of life

## 4. Methods

This study addressed to understand how residents' perception of the New Silk Road tourism infrastructure creates residents' understanding of the quality of life. More specifically, this survey aims to investigate the relationship between the New Silk Road tourism infrastructures on residents' quality of life through the mediating effect of sustainable tourism development. This research adopts a correlation design to examine the associations of New Silk Road tourism infrastructure, sustainable tourism development, local communities' quality of life, and overall life satisfaction.

This research study has taken all the scale items from the previous researches. Residents' perception of the New Silk Road development of the tourism infrastructure scale consisted of 14 items modified from past research (Kim et al., 2013; Nazneen et al., 2019). Hence, in the context of the tourism infrastructure associated with New Silk Road, the dependent variable of quality of life consisted of 12 items and adapted from previous studies (Andereck and Nyaupane, 2010; Andereck et al., 2007; Kim et al., 2013; Sirgy, 2001; Woo et al., 2016). Besides, quality of life explains community and individual satisfaction due to the tourism infrastructure projects. The scales of perceived sustainable tourism development consisted of 16 items taken from the sustainability guidelines of prior researchers (Choi and Sirakaya, 2006). Scale items were anchored on a five-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The study utilized SPSS version 23 to test data analysis, and the Process Method, which based regression analysis on testing the study hypotheses (Abbas et al., 2019d; Abbas et al., 2019e; Abbas et al., 2019f). Firstly, exploratory factor analysis (EFA) conducted to test loading factors respective with scales. Next, using AMOS version 23, we performed confirmatory factor analysis (CFA) to test the measurement model fitness. Finally, we utilized the regression-based analysis procedure by the PROCESS method (Hayes, 2017; Leeflang et al., 2018) for SPSS version-23 to check the significance of proposed model relationships. Additionally, all scales checked for consistency of reliability, discriminant, and convergent validity (Aman et al., 2019a,b,c).

### *4.1. Targeted population*

The study selected this sample size from the population, which originates from the Almaty region of Kazakhstan. There are several explanations for the selection of this survey execution in Kazakhstan. Since the beginning of the history of Silk Road,

Kazakhstan has offered a crossroads of civilizations because of its geographical position, which plays a vital role in Connection-bridge between Asia and Europe. Thus, Kazakhstan preserved a rich cultural and historical heritage of UNESCO World Heritage, and these heritages considered valuable at the global and national levels. Currently, being the center of cross-cultural trade routes, Kazakhstan also plays a vital role in New Silk Road development. New Silk Road crosses East, West, and South, North, and Central Kazakhstan regions. It means that new infrastructure construction (construction, highway, pipelines, gas and oil, railway, and agriculture development) contains entire Kazakhstan regions. Infrastructure has a significant impact on the population and destination. Thus, we selected Kazakhstan and conducted a survey.

Table 3 shows the respondents' demographic analysis, and it indicates that male respondents are 191, which presents 44.90% of the sample size. The female participants are 234 (55.10%), which shows that females are more than males in this survey. There are 91 (21.40%) within the age range of 18–30 years, 108 (25.4%), between 30 and 40 years, 140 (32.9%) within 40–50 years, and 86 (20.20%) with age over 50 years, respectively. There were 29 (6.80%) with high school education, 73 (17.20%) with intermediate 73 (17.20%), bachelor degree 201 (47.30%), master degree 79 (18.60%), and Ph.D. degree holders 43 (10.10%), respectively. Concerning respondents' occupation, 99 (23.30%) had Government jobs, 68 (16.0%) had private posts, 63 (14.80%) were businesspersons, and 195 (45.90%) was another status. 62 (14.60%) residents resided between 1 and 10 years in the destination place. The 93 (21.90%) residents had been there between 10 and 20 years, 67 (15.80%) were between 20 and 30 years, and 203 (47.80%) residents had lived there for more than 30 years. Regarding monthly income, 199 (46.80%) respondents' income was less than 100,000, 137 (32.20%) respondents' had income between 100,000–150,000, 71 (16.70%) had between 150,000–200,000 and 18 respondents' income was more than 200,000 Tenge, respectively.

### 4.2. Designing a questionnaire

The authors used translated items of the scales to collect data and drafted scale-items in English first. The authors invited three experts from native English-speaking countries in the tourism field to check and determine the scales' validity and consistency. After scale items translated from English to Russian using a translation method, as suggested by the previous studies (Antonova-Unlu and Wei, 2020; Dmitrieva, 2019; Zaytsev, 2016). Next ensuing were consultations and discussion among all the authors on each scales items; we sent to three professors in Tourism and two professors in the Philology field from Kazakhstan to check details consistency and crucial elements with issues related to tourism development in Kazakhstan. Although there were no significant improvements on the scale items, the study used some of the phrasings, including its description, which upholds semantic accuracy in translated versions between Russian and English. After the research team of this study agreed with the revised version of the questionnaire, the authors distributed the project questionnaire online among selected residents. The study incorporated a snowball sampling method to collect the required data sets to draw the study results As Kazakhstani researchers noted, in the conditions of research in Kazakhstan, there is a very low tendency of the population to take part in the survey (Abbas et al., 2019e). Therefore, a snowball sample was utilized as a communication technique, and a referral method to obtain a high number of answers between the residents that were selected for the present study (Frey, 2018). Initially contacted, investigators requested the study respondents to spread questionnaire forms to

**Table 3**
Demographic Profile of the respondents.

| Variables | Dimensions | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 191 | 44.90% |
| | Female | 234 | 55.10% |
| Age | 18–30 years | 91 | 21.40% |
| | 30–40 years | 108 | 25.4% |
| | 40–50 years | 140 | 32.9% |
| | Above 50 years | 86 | 20.2% |
| Educational background | High School | 29 | 6.80% |
| | Intermediate | 73 | 17.20% |
| | Bachelor | 201 | 47.30% |
| | Master | 79 | 18.60% |
| | Ph.D. | 43 | 10.10% |
| Occupation | Government job | 99 | 23.3% |
| | The employee in private organization | 68 | 16.0% |
| | Businessman | 63 | 14.8% |
| | Others | 195 | 45.9% |
| Years of residency | 1–10 years | 62 | 14.60% |
| | 10–20 years | 93 | 21.90% |
| | 20–30 years | 67 | 15.80% |
| | Above 30 years | 203 | 47.80% |
| Monthly income | Less than 100,000 | 199 | 46.80% |
| | 100,000–150,000 | 137 | 32.20% |
| | 150,000–200,000 | 71 | 16.70% |
| | Above than 200,000 | 18 | 04.20% |

***Note:*** Monthly income in ("Tenge" Kazakhstan currency).

acquaintances who live in Kazakhstan tourism destinations (Abbas et al., 2018, 2020; Mubeen et al., 2020). The survey also collected respondents' general information, such as gender, age, education, profession and years of residency, monthly income, which were in the first section of the questionnaire, and second was addressed the critical and influencing infrastructure, tourism, well-being factors.

### 4.3. Size of respondents sample and data processing

The authors received duly filled responses, and researchers checked and assorted all survey profiles. The authors distributed 600 surveys to the selected respondents. The authors collected 450 filled survey forms, and the authors excluded 25 incomplete responses, as respondents' did not duly fill it. Based on the remaining 425 complete questionnaires, the authors screened and entered data for analyses purpose. This study incorporated an analytical tool PROCESS v2.16.3 for SPSS to proceed with the analysis of the data received. At the last stage, statistical data analysis indicated interpreted results helpful and provided useful information for assessing the main factors. Besides, three Kazakhstani professors from the field of Tourism already contributed during the data collection procedure. The authors requested them to join again to provide their input based on their experience and comment on the data findings.

## 5. Results

### 5.1. Sample profile of residents

As revealed in Table 3, 55.1% were female participants, and nearly 63% of participants from the last 30 years belong to this region. Analysis classification of occupations demonstrated that 14.8% of participants were involved in their own business. The 23.3% of respondents were employed in government jobs, and 16.0% of respondents were employees in working in private companies or services, 46.8% respondents monthly income less than 100000 Tenge, 47.3% respondents have a bachelor degree, and the central mass of 45.9% of the participants was per diem income employees, travel guides. These local farmers engaged in agriculture-related businesses. The percentage of the participants were aged somewhere around 30 and 50.

### 5.2. Common method variance

Researchers argued that there were probabilities of standard the variance method (CMV) when the dependent and independent variables in the questionnaire survey tested the same time from the same data source (Eden et al., 2019; Podsakoff et al., 2012). Although CMV may harm research results, thus addressing this issue is vital. Scientists suggested various methods for evaluating the CMV problem in the data source. A commonly utilized method/way is CMV is Harman's single factor. According to this method, if the first coefficient does not imply a value higher than 50%, then there is no significant CMV issue in the data source. This study findings have indicated three factors (New Silk Road infrastructure, sustainable tourism, quality of life) were tested in the data source with eigenvalues >1, which is 73.45%. The first coefficient revealed only a 26.55% variance, which is less than 50%. Thus, there is no CMV issue in the data (Eden et al., 2019; Podsakoff et al., 2012).

### 5.3. Model fit, validity, and reliability of the study constructs

This study applied the confirmatory factor analysis (CFA) to test the proposed measurement model fitness of this study. Similarly, the study considered several relevant indicators to check if the measurement model fits the data. The $x^2/df = 1.704$, goodness of fit index (GFI) = 0.869, adjusted the goodness of fit index (AGFI) = 0.855, Tucker–Lewis index (TLI) = 0.948, normed fit index (NFI) = 0.889, comparative fit index (CFI) = 0.951, and the root mean square error of approximation (RMSEA) was noted as 0.041. All the calculated values showed satisfactory levels with a good model fit (Bagozzi and Yi, 2011; Civelek, 2018). It means the CFA estimation indicated that the proposed three-factor model was the best fit for this sample data.

Furthermore, to test dimensions, reliability, and validity performed confirmatory factor analysis (CFA) utilizing the maximum likelihood method (Sharma et al., 2003). Findings revealed that the value of standardized loading for each scale-item is greater than 0.60, values of composite reliability (CR) > 0.70. Values of Cronbach's alpha (CA) > 0.70, and average variance extracted (AVE) > values were greater than the 0.50 the acceptable value (Bagozzi and Yi, 2011; Civelek, 2018), as shown in Table 5. The results show that this research model has consistency, convergent validity, and good composite reliability (Creswell and Creswell, 2017; Millsap, 2012).

The square root of the AVE values results shows study discriminant validity. Each ratio values of AVE square root were more significant than the inter-correlation of every construct. Findings point out that all variables were different (Hair et al., 2017). Thus, the dimension model has good discriminant validity, and it is reliable to use structural correlations. Besides, we have checked descriptive analysis, which consists of Mean, Standard deviation, and Correlations between the variables (Table 4).

### 5.4. Hypotheses testing

The standardized coefficient values, SE - value, t-values, and *p*-values performed to show the study hypotheses. Table 6 shows the results of this proposed study hypotheses. The positive perception of NSR tourism infrastructure development

**Table 4**
Means, Standard Deviation, and Correlations between the study variables.

| Variables | Mean | SD | NSRTI | STD | QOL |
|---|---|---|---|---|---|
| NSR tourism infrastructure (NSRTI) | 3.87 | 0.939 | **0.75** | | |
| Sustainable tourism development (STD) | 4.11 | 0.923 | 0.26** | **0.74** | |
| Quality of Life (QOL) | 3.65 | 0.902 | .29** | .22** | **0.75** |

**Note.** SD = Standard deviations, **p < 0.001, figures in bold are values of square root of AVE.

has significantly predict perception of sustainable tourism ($\beta = 0.26$, se = 0.046, t = 5.550, $p < 0.05$), validating stated H1. The findings also reveal positive perception of NSR tourism infrastructure significantly predict residents' quality of life, supporting H3 ($\beta = 0.15$, se = 0.045, t = 3.373, $p < 0.05$). Results also supported stated H2, showing the positive perception of sustainable tourism significantly influences on positively formulation residents' quality of life (QOL) ($\beta = 0.24$, se = 0.046, t = 5.290, $p < 0.05$). Besides, findings indicated in Table 7 that outcome variables (residents' quality of life and sustainable tourism development) are significant.

Table 7 presents the results of R, R-square, Mean square error (MSE), *p-value,* and degree of freedom by using PROCESS method for the model estimation and examining the mediating effect between residents' perception of New Silk Road tourism infrastructure development and their perception of the quality of life. Table 7 indicates satisfactory values.

This study model applied the 5000 bootstrap samples method proposed by (Hayes, 2017; Leeflang et al., 2018) for testing mediating effects by assuming standard errors. According to this method, if the 95% biased corrected confidence intervals, such as lower confidence intervals (LLCI) and upper confidence intervals (ULCI), are high than "0" value, then the factor is significant, and it plays the mediation role. Table 8 describes the findings of this study, for instance, perceived sustainable tourism development plays a role of partial mediation relationship between perceived New Silk Road tourism infrastructure and residents' perception of residents' quality of life. The results are satisfactory, as indicated in Table 8 (LLCI: 0.031, ULCI: 0.0108). Besides, the results also show the indirect effect between perceived the New Silk Road and tourism infrastructure development and perceived local communities residents' quality of life through perceived sustainable tourism found a significant relationship (indirect effect $\beta = 0.06$, $p < 0.05$). The direct impact of perceived the New silk road impact on tourism infrastructure based on perceived residents' quality of life indicated a significant result ($\beta = 0.15$, $p < 0.05$). These study findings specify that perceived sustainable tourism development partially mediates between perceived New Silk Road tourism infrastructure development and perceived local communities residents' quality of life.

## 6. Discussion

Tourists' experience and their satisfaction define their traveling motivation (Devesa et al., 2010). A study described that a tourism destination with comfortable, modern, new infrastructural attributes satisfies tourists' needs and enhance the opportunities of having loyal tourists (Bi et al., 2020; Mathew and Sreejesh, 2017; Shafiee et al., 2019; Sukiman et al., 2013). Tourist satisfaction with tourist destination attractions is considered a predictor for revisiting behavior, which will ultimately increase tourism activity in destinations (Devesa et al., 2010; Sukiman et al., 2013). Tourism activity generates new business, more taxes, and revenue for local management funds that contribute to finances for promoting future sustainable tourism policies and preservation of the tourism heritages and attractions by ensuring the destination sustainability. Along with the construction of new infrastructure at the destination, local residents' positive behavior, support, and responsibility actions may also influence the future flourish of tourism destinations. Through the present study, we attempted to investigate the residents' perceived New Silk Road tourism infrastructure by sustainable tourism development, aiming to enhance their quality of life in Kazakhstan. In the present study, we performed an advanced method utilizing AMOS software V-32, a widely utilized CFA to analyze measurement model fitness. Besides, we used the PROCESS method for SPSS, which proposed by scholars to test hypothesis interactions. The bootstrap approach is utilized to verify indirect, direct, and effects in the PROCESS method that yields the most accurate confidence intervals for the indirect effect estimation (Hayes, 2017; Leeflang et al., 2018). The respondents' demographic profiles showed that among the respondents, there are women more than men are (women 234 = 55.1%; men = 191, 44.9%).

Study findings confirmed the positive relationship between perception of New Silk Road tourism infrastructure development and enhanced residents' perception of the quality of life through the mediation effect of sustainable tourism development in Kazakhstan, and results maintained all proposed hypotheses. For example, Hypothesis 1 demonstrated that perceived New Silk Road tourism infrastructure positive impact on enhancing residents' perception of the quality of life ($\beta = 0.15$, $p < 0.05$). Hypothesis 2 stated that residents' perception of the New Silk Road tourism infrastructure had a positive and significant impact on the development of sustainable tourism in the destination ($\beta = 0.26$, $p < 0.05$). Perceptions of sustainable tourism play a mediating variable between NST infrastructure development and quality of life (indirect effect $\beta = 0.06$, $p < 0.05$), and in Table 8, the results demonstrated these positive interactions. Hypothesis 3 ($\beta = 0.24$, $p < 0.05$) claimed that communities' perception of sustainable tourism development positively affects residents' quality of life. The endogenous variables results ((1) Sustainable tourism development and (2) quality of life) indicated that R= (1) 0.260 and (2) 0.331, R2 = (1) 0.067 and (2) 0.110, showing all p-value are significant. It confirmed that the PROCESS path model, based on regression analysis, is satisfactory regarding endogenous outcomes. The results also revealed that three jointly three variables

**Table 5**
Estimates loadings, AVE, and CR.

| Constructs | Indicators | Loadings | AVE | CR | CA |
|---|---|---|---|---|---|
| New Silk Road tourism infrastructure | | | 0.56 | 0.945 | 0.949 |
| Physical infrastructure | New Silk Road will provide excellent and safe public transportation. | 0.67 | | | |
| | New Silk Road will reduce shipping costs and will provide access to high-quality modes of vehicles. | 0.61 | | | |
| | New SILK ROAD will provide access to the quality of public services (fire, police, and other). | 0.58 | | | |
| | The development of the New Silk Road is vital to generate a destination image in the area. | 0.55 | | | |
| | New Silk Road saves the journey time to a tourism destination. | 0.51 | | | |
| Social infrastructure | New Silk Road will increase new business opportunities for all residents. | 0.54 | | | |
| | New Silk Road will generate employment opportunities for backward people. | 0.56 | | | |
| | New Silk Road will provide quality employment and skills for improved livelihood opportunities. | 0.54 | | | |
| | New Silk Road will support for promoting local products. | 0.54 | | | |
| | New Silk Road will increase local community participation and public awareness. | 0.59 | | | |
| | New Silk Road Infrastructure generates new tourism and recreation areas. | 0.52 | | | |
| Environmental infrastructure | New Silk Road will increase the number of services and activities (travel agency, hotel, restaurants, entertainment, shopping centers, stadiums, exhibitions, and other vital services facilities). | 0.54 | | | |
| | | 0.57 | | | |
| | New Silk Road will construct modern national parks, water parks, and reserves. | 0.60 | | | |
| | New Silk Road will preserve flora and fauna with modern methods and will develop natural landscapes with contemporary approaches. | | | | |
| Sustainable tourism development | | | 058 | 0.945 | 0.954 |
| Economic sustainability | Tourism increases household income. | 0.66 | | | |
| | Tourism generates employment opportunities and benefits in the area. | 0.55 | | | |
| | Tourism improves the living standard of the local people. | 0.59 | | | |
| | Tourism promotes local enterprises. | 0.57 | | | |
| | Tourism integrated economy. | 0.56 | | | |
| Social Sustainability | Tourism provides benefits for backward people. | 0.54 | | | |
| | Tourism creates social programs/schemes for backward people. | 0.52 | | | |
| | Tourism increases the empowerment of local communities. | 0.57 | | | |
| | Due to new employment opportunities in tourism areas, will minimize the societal problem. | 0.59 | | | |
| | Tourism will support enterprises' benefits for backward people. | 0.53 | | | |
| Cultural sustainability | Tourism will increase the management and conservation of heritage sites. | 0.56 | | | |
| | Promotes better understanding between cultures and enhance the level of cultural awareness of locals. | 0.52 | | | |
| | | 0.58 | | | |
| | Preservation of traditional rural landscapes. | | | | |
| Environmental sustainability | Tourism will provide waste management. | 0.51 | | | |
| | Tourism will provide conservation and protection of natural areas (mountain, lake, sanctuaries). | 0.56 | | | |
| | Tourism generates business activities. | 0.59 | | | |
| Quality of Life | | | 0.57 | 0.936 | 0.937 |
| Material well-being | Satisfaction with income and employment. | 0.60 | | | |
| | Satisfaction with the cost of living | 0.55 | | | |
| Community well-being | Satisfaction with the facilities you get in this community. | 0.54 | | | |
| | Satisfaction with people who live in the community | 0.54 | | | |
| Health and safety well being | Satisfaction with health well-being. | 0.55 | | | |
| | Satisfaction with safety well-being. | 0.51 | | | |
| Emotional well-being | Satisfaction with spiritual life. | 0.56 | | | |
| | Satisfaction with leisure life | 0.52 | | | |
| | Satisfaction with cultural life. | 0.54 | | | |
| The overall quality of life (QOL) | Your life as a whole. | 0.58 | | | |
| | The way you spend your life. | 0.55 | | | |
| | The feeling about your life compared to others. | 0.53 | | | |

***Note.*** *CFA, confirmatory factor analysis, AVE, Average variance extracted, CR, composite reliability.*

73.45% of the variance explained there is no issue in data. The findings reveal that the completely proposed hypothesis is statistically significant concerning the acceptance of the model.

The main findings local communities perceived that the tourism infrastructural opening long-term opportunities associated with job opportunities, community participation, quality of public services and roads, modern transport vehicles, skill training, improvement courses, advantages for new business, income, public awareness, and others. All these factors reflect the responsibility and cooperation perceptions of the local community for the process of infrastructure development, and this motivates people in society to promote their affirmative action concerning sustainable tourism that reflects through economic, social, cultural, and environmental sustainable domains (Yoosefi Lebni et al., 2020). In this present study, we investigated the implications of local communities' perception of New Silk Road tourism infrastructure development on local Kazakh inhabitants' life. The present study found new empirical explanations on enhancing the quality of life directly from tourism infrastructure and indirectly from sustainable tourism development.

Kazakhstan's historical aspects and the traces of ancient Silk Road enriches the socio-cultural impacts, nomadic life, and medieval mausoleums, architecture. All these unique features are significant factors that encourage international tourists to visit an exotic tourist destination, feel ancient Silk Road. Previous studies suggested that preserved cultural heritages might attract foreign tourists. Suppose the destination place offers them to see natural beauty and unique Silk Road heritages

**Table 6**
Path analysis.

| Factors | Standard Coefficient | SE - value | t-value | 95% biased confidence interval | | Results |
|---|---|---|---|---|---|---|
| | | | | LL | UL | |
| NSR tourism infrastructure to QOL | 0.15** | 0.045 | 3.373 | 0.064 | 0.243 | Supported |
| NSR tourism infrastructure to STD | 0.26*** | 0.046 | 5.550 | 0.165 | 0.346 | Supported |
| Sustainable tourism to QOL | 0.24*** | 0.046 | 5.290 | 0.154 | 0.337 | Supported |

***Note:*** ***p<0.005, ***p<0.001. NSR = New Silk Road, QOL = Quality of life, STD = Sustainable tourism development.*

(Chang, 2019; Kim et al., 2013; Makuvaza, 2018; Nazneen et al., 2019). Researchers have emphasized that community perceptions and their cooperation, decisive action helps to develop sustainable tourism (Abubakirova et al., 2016; Abukari and Mwalyosi, 2020; Byrd, 2007; Daye et al., 2019). Indeed, the local community, by their action and behavior affects sustainable tourism. The Government of Kazakhstan, proposing the New Silk Road infrastructure, argued that the importance of expanding infrastructure provides long-term prospects for the local community. The previous studies support the primary purpose that tourism infrastructure is vital to residents' quality of life, and it is progressively crucial in generating infrastructural attributes to attract international visitors (Bi et al., 2020; Kanwal et al., 2020; Shafiee et al., 2019; Wang et al., 2020).

More specifically, this study's first objective was to test the effect of residents' perceptions of New Silk Road tourism infrastructure projects on their perception of the quality of life. It explains that the favorable perception of New Silk Road tourism infrastructure has a significant effect on the formulation of local communities' perceptions of quality of life in Kazakhstan that is consistent with this study's assumption and associated with relevant studies (Andereck and Nyaupane, 2010; Uysal et al., 2016). Uysal et al. (2016) argued that tourism development indicates a definite link to local community perception of the quality of life and well-being (Uysal et al., 2016). Usually, tourism infrastructure is the beginning of enhancing residents' quality of life because of its relevance to significant prospects, including new business enterprises and employment opportunities, more income, and quality services. We found the same results indicating that local communities in Kazakhstan have a positive perception of the New Silk Road tourism infrastructure and related programs. Residents believe that the New Silk Road initiative for tourism infrastructure projects will increase business and economic activities, which provides millions of opportunities for the local community. Findings also indicated that residents perceived that New Silk Road tourism infrastructure development ensures the restoration of natural values such as the construction of national parks and reserves with modern facilities, preserving wildlife with current approaches. Hence, the results relevant to earlier researches results, which confirmed that infrastructure development leads to cultural and natural landscape protection, and it enhances the socio-economic benefits and employment prospects (Hutchings et al., 2020; Read, 2013). Based on the findings, this study provides awareness among the local community related to tourism infrastructure development. It suggests how New Silk Road tourism infrastructure will change their future by increasing their quality of life and how it is a beneficial land connectivity perspective for the largest landlocked country as Kazakhstan.

The second purpose of this study model was to test the relationship between New Silk Road tourism infrastructure and sustainable tourism development as perceived by residents. Tourism infrastructure projects can stimulate marketing campaigns to attract visitors, and such projects can refine the sustainable development of tourism. Sustainable tourism can generate perspectives for small family enterprises and backward people, and it leads to enhance cooperation and favorable action. Accordingly, study results established that Kazakhstan people's perceptions concerning infrastructure development along with the Silk Road, have a significant influence on their understanding of sustainable tourism development. The study results also verified the importance of creating an environmentally accountable and socially friendly approaches tourism infrastructure within local people support of all tourism initiatives. Mostly, residents' socio-cultural expectations associated with solving social problems and increasing empowerment, awareness, cultural exchanges, cultural events, and the study findings are consistent with previous research studies (Almeida-García et al., 2016; Látková and Vogt, 2011).

The third purpose of this study was to examine the relationship between perception of sustainable tourism development and residents' quality of life. Residents' perceived that sustainable tourism directly creates local communities' tangible and nontangible benefits, such as new business events, income, job opportunities, and increase their pride for the community, high attachment, cultural identity. Importantly, residents' in the community believe that tourism may contribute opportunities for backward people. Therefore, these study findings indicated that all community members' affirmative action in the process of tourism infrastructure generates sustainable tourism. Each individual in the community has their perception, action, ability, skills, and talent that may attract tourists and may protect destination areas. The findings show are similarities

**Table 7**
Presents the results of R, R-square, *p-value,* and degree of freedom.

| Outcomes | *R* | *R-sq* | *MSE* | *df2* | *p-value* |
|---|---|---|---|---|---|
| Sustainable tourism development (STD) | 0.260 | 0.067 | 0.797 | 423.00 | Significant |
| Quality of life (QOL) | 0.331 | 0.110 | 0.728 | 422.00 | Significant |

***Note:*** ***p <0.005,* STD, sustainable tourism development, QOL, Quality of life.

**Table 8**
Results of the bootstrapping method for mediation.

| Effects | | Coefficient | Boot SE | 95% biased corrected confidence interval | | Results |
|---|---|---|---|---|---|---|
| | | | | LL | UL | |
| Indirect effect | NSRTI- > STD - > QOL | 0.06 | 0.019 | 0.031 | 0.108 | Partial Mediation |
| Direct effect | NSRTI - > QOL | 0.15** | 0.45 | 0.064 | 1.243 | – |

*Note:* **p < 0.005, NSRID, NSR Infrastructural development, STD, sustainable tourism development, QOL, Quality of life.

with previous studies (Hanafiah et al., 2016; Mathew and Sreejesh, 2017; Woo et al., 2016). Results also showed that sustainable tourism development perceived by residents significantly mediated the relationship between New Silk Road tourism infrastructure and the quality of life of residents. It indicates that residents observed sustainable tourism positive aspects serve as action through tourism infrastructure projects indicate a link to the quality of life of residents. In other words, it can describe the infrastructure that improves sustainability in a destination that, in turn, leads to enhance residents' quality of life (Fu et al., 2020; Mathew and Sreejesh, 2017; Musavengane and Kloppers, 2020; Woo et al., 2016).

Kazakhstani residents pride with culture and its preserved cultural and historical heritages, which associated with Silk Road. According to residents, the cultural heritages under tourism development creates a beneficial reputation and enhance their well-being in their regions. These findings show that new tourism infrastructure plays a crucial role in achieving tourism development and ultimately leads to making better residents' quality of life. With the development of New Silk Road tourism infrastructure, the natural beauties, unique nomadic culture, UNESCO World Heritage Sites in Kazakhstan are likely to develop sustainable tourism. In the present study, we recognized two factors that affect residents' quality of life, including tourism infrastructure and sustainable tourism development, and these findings are consistent with previous studies (Fu et al., 2020; Godfrey, 1998; Woo et al., 2016). Besides, this current research found that the New Silk Road tourism infrastructure in Kazakhstan develops residents' positive perception of sustainable tourism development, which may turn to increase their quality of life. Thus, we may explain that along with the United Nations and WTO's Silk Road program, China's New Silk Road infrastructure via residents' cooperation also influences on the development of sustainable tourism in Kazakhstan. This study has novelty and value. It addresses the management and organization of communities' livelihoods and quality of life, resulting from tourism infrastructure on sustainable tourism development. It provides an understanding of the importance of collaboration between the residents and governments in the context of New Silk Road tourism (Almeida-García et al., 2016; Grundey, 2008; Kanwal et al., 2020; Khan et al., 2020; López et al., 2018; Musavengane and Kloppers, 2020).

## 7. Conclusion

Current research focuses on how the New Silk Road Tourism Infrastructure influences residents' quality of life through sustainable tourism development in Kazakhstan. The study provides useful insights into the unity of the host communities. It shows residents' cooperation with the Government to develop economic opportunities for better life quality. The local communities can become a binding force on possible future prosperity through a sustainable tourism environment in the region. This study proposes a method to study and analyze the specified factors of tourism infrastructure for sustainable tourism development in improving the quality of life of the local communities. The study contributes to scientific knowledge by exploring residents' actions in infrastructure projects and recognizing the importance of sustainable tourism in Kazakhstan. The study focused on exploring the impact of tourism on residents' quality of life in the context of the New Silk Road Initiative. The residents of Kazakhstan believe that the NSR tourism infrastructure strategy positively affects sustainable tourism development and the quality of life of the local communities.

As a result, the residents' support sustainable tourism at destinations under NSR infrastructure development. It is the first study that focuses on exploring the influence of the New Silk Road Tourism openings and local communities' perceived understanding of sustainable tourism development for their quality of life. Besides, this is the first study, which identifies that the New Silk Road and tourism infrastructure projects are in line with the goals of the United Nations and the World Trade Organization (WTO). New Silk Road Tourism Project in Kazakhstan provides numerous opportunities to improve residents' quality of life. The proposed model of this study provides the most useful aspects of perceived tourism infrastructure benefits. This study specified that the perception of the overall quality of life of the communities in Kazakhstan specified linkage to sustainable tourism and infrastructure initiatives. Sustainable tourism under the new Silk Road tourism infrastructure is an affirmation of the overall quality of life of local communities. The experts believe that the New Silk Road tourism infrastructure is a predictor of the development of residents' quality of life.

Besides, the mediation role of sustainable tourism development requires increasing attention to sustainable livelihoods, civil society interaction, and environmental protection awareness. At the same time, tourism areas strive to strike a balance between sustainable growth and development, and long-term tourism infrastructure can improve efforts to develop sustainable tourism. These efforts can raise living standards and enhance the image and competitiveness of tourist destinations, improving the quality of residents' lifestyles in the region.

## 8. Implication

This study results improved the conceptual framework to interpret the interrelation of perceived New Silk Road tourism infrastructure influence to enhance residents' perception of the quality of life via cooperating to develop sustainable tourism. Relatedly, by developing and examining the research model, the present study contributed the scientific knowledge to tourism literature that explained that residents show a willingness to collaborate with the Government proposed New Silk Road tourism infrastructure to develop future sustainable tourism in Kazakhstan. The research findings can significantly contribute to tourism management, and China and Kazakhstan government needs to develop a viable destination. Overall, this study expanded the literature of tourism management from the perspective of tourism infrastructure and found it is a factor enhancing residents' quality of life by sustainable tourism development.

The results have several political implications for government leaders, politicians, and tourism planners. Long-term, the New Silk Road infrastructure development protects and invests in reviving cultural heritage. Ancient monuments associated with historic Silk Road infrastructure has the power to develop sustainable tourism along Silk Road, which turns to improve residents' quality of life. This proposed tourism infrastructure model might be useful in neighboring countries of Kazakhstan along with the New Silk Road and other joint countries, which are trying to develop community-based sustainable tourism development.

Based on the sustainable development indicators, the tourism planning process should be taken in more attention to developing the social skills and stimulation of domestic production—it suggesting that tourism projects must aim at providing direct benefits to the residents. For example, developing and fostering jobs and entrepreneurial prospects for local citizens, improving utilization of existing community abilities and talents; increase attempts to expand activities by minimizing leakage or maintaining local economy even more revenue as possible. The Government must encourage local tourism products, focusing on additional benefits and merchandising of modest services and goods, and promoting small and medium scale businesses. For building a beneficial atmosphere among industry and residents relations, there are also must be created self-employment advantages and seed money for start-UPS. All of these tourism business activities could even ultimately lead to long-term community prospects, thus ensuring perceptions of sustainable development in tourism.

The development of a positive view of the region's residents on the quality of work performed is also the basis for an initiative in the field of sustainable tourism. Furthermore, the creation of professional and technical schools in tourist areas to enhance specifications and coverage of technical training agendas can develop a positive perception of sustainable tourism development. It needs to follow by complete and accurate assessments of the requirements. Moreover, New Silk Road strategies allow that for a fair share of overall travel costs at the local level and encourage visitors to use products and services from tourism destinations that may make considerable changes. It reminds government officials that it is not just a job and a meager income, but rather a perception by community residents that the level of productivity of an individual and a stable income to support life is vital for the well-being of the community. Therefore, positive perception about income opportunities need to generate among people, and they should know that such prospects are full-time, successive, and sustainable. Thus, rigorous policy decisions to monitor the situation and the cooperation of government officials with the local community is key to achieving sustainable tourism development.

Besides, when evaluating the variable related to sustainable tourism development, the investigators noted that policy-makers should pay attention to achieving the positive political projects/initiatives, empowering the socioeconomically disadvantaged people, and involving people in the area in events tourism-related. Policymakers can implement local community awareness projects on how tourism and its economic, social, and environmental benefits influence residents' quality of life. Social media is a new fast-growing technology, and government officials might use this platform to share posts on social media to release the advantages of the New Silk Road tourism infrastructure in the local community publicly. Besides, attracting skilled residents as active players in the industry and offering them the chance to participate in the decision-making process and choose their most preferred development path is crucial for the achievement-term maintenance of the investments. Government officials and tourism planners must consider local people's interests in helping to protect cultural and traditional heritage. Local communities' active involvement in the management process is essential. Because, if the local people wholeheartedly encourage the implementation of tourism, they should be deemed professionally engaged in the tourism industry.

Finally, it is vital to ensure the participation of local authorities in tourism development and to propose capacity-building schemes to them and communities' participants to increase their viewpoint of tourism and its related aspects of sustainable development. The results of this survey recommend that government officials consider the residents during the tourism infrastructure planning and realization of sustainable tourism, there must be a project targeted on the shared needs of visitors and residents.

Although the research respondents did not solve the social problems that may arise from the new Silk Road tourism infrastructure, such as drug trafficking, slave labor, and commercial sex trafficking, therefore, the vigilance of officials is crucial to address such problems. The officials need to pay attention to these problems. Besides, to achieve sustainable tourism development, accurate political control and decisions are required. Careful administration and the scientific method for the upcoming tourism infrastructure of the New Silk Road are essential for breakthrough progress in its capacity. Concentrating on the development of appropriate infrastructure services like roads, shopping centers, healthcare, education, banking, and others can have a substantial potential impact on the satisfaction of community members.

## 9. Limitations and future direction

There are some limitations to this research study, which would help conduct future research studies. Initially, the present research has only emphasized the potential path of the New Silk Road tourism infrastructure plan. In contrast, there must be noted the undesirable influence of tourism on the residents in the context of New Silk Road, such as economic, social, and cultural, environmental concerns.

Secondly, this research has focused on only Kazakhstani residents, while politicians and officials claim that the New Silk Road is a vast megaproject that includes Central Asian along Silk Road. By having a shared cultural heritage of Silk Road, Central Asian states may create a remarkable network of tourist attractions and probably have new business opportunities through cooperative marketing initiatives and future promotions. For example, new transportation infrastructure pass entire Central Asia, and it may attract tourists. Connectivity of infrastructure offer tourists to see and feel old Silk Road, which in result could offer significant benefits to make tourism more sustainable in landlocked Central Asian countries. Transportation infrastructure creates regional connectivity in landlocked Central Asia that may promote new business trades among counties and will result to enhance local communities' standard of living conditions. This study recommends that future scholars take into account the local people of Central Asian countries such as Kyrgyzstan, Uzbekistan, and Tajikistan. Additionally, there must be an investigation of the locals' perception of tourism development, including their perceived positive and negative impacts on a destination associated with the New Silk Road project.

Thirdly, this study provides an overview of the New Silk Road Plan's strategies and initiatives from the perspective of local communities that aimed to help the Silk Road tourism become more sustainable, competitive, and productive. The survey participants were the local communities residing in the study areas. Future research may take into account the collaboration of all interested parties' participation, which their awareness positively impact on tourism sustainability, while protecting its natural and cultural resources or their financial contribution to social problems may reduce poverty.

Fourth, in the current study, the authors discuss residents' views on sustainable tourism as a mediation variable. Future researchers can explore more basic processes from this perspective, such as the sustainability of market performance, as it is also critical to provide long-term competitiveness in agricultural and rural business activities.

Finally, the experience of road and transport infrastructure development, taking into account the principle of sustainability, may be relevant to sustainable tourism development strategies. Accordingly, a more in-depth study of this area will make a significant contribution to tourism research and will ensure an understanding of tourism practices.

## Author contributions

GM, conceptualized the idea of the study design, performed the statistical analysis, collected data, and wrote the manuscript. JA (Abbas) contributed direction on abstract and discussion writing, review and editing, and approving the edited manuscript. S.M. contributed to data screening and literature. A.Z. contributed to data arrangement and research of the literature. JM provided intellectual insights and supervised this study.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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