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Islamic Finance as an Alternative of Infrastructure Financing for Asian Landlocked Developing Countries

Asya'nın Karayla Çevrili Gelişmekte Olan Ülkeleri İçin Altyapı Finansmanı Alternatifi Olarak İslami Finans

Mohammad Asif NIAMAN
Yüksek Lisans Öğrencisi, Sakarya Üniversitesi, Sosyal Bilimler Enstitüsü, İslam Ekonomisi ve Finansı EABD
Master's Degree Student, Sakarya University Institute of Social Sciences, Department of Islamic Economics and Finance
Sakarya/Türkiye
asif.niaman@gmail.com orcid.org/0000-0002-3622-0019

Hakan ASLAN
Dr. Öğr. Üyesi., Sakarya Üniversitesi, İslam İktisadı ve Finans Bölümü
Asst. Prof., Sakarya University, Faculty of Political Sciences, Department of Islamic Economics and Finance
Sakarya/Türkiye
hakanaslan@sakarya.edu.tr orcid.org/0000-0003-2923-6837

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Islamic Finance as an Alternative of Infrastructure Financing for Asian Landlocked Developing Countries

Abstract

Various infrastructure financing methods are being used worldwide, each with its own set of advantages and obstacles. Basically, the advantages and disadvantages of a financing method manifest differently depending on each country's economic system, geographical location, economic dependency, political conditions, cultures, and beliefs. Using a funding strategy in one country may be beneficial under certain situations but harmful in another. As a result, the usefulness and efficacy of financing methods should be studied in light of the countries' circumstances. The Asian Landlocked Developing Countries (LLDC), which share the same fate in terms of geographical constraints and economic reliance, are grappling with severe infrastructural gaps in all sectors. These countries have an emerging economy, are largely dependent on agriculture, have a poor management structure, are unorganised and have weak financial markets, and rely heavily on their neighbours' transit routes to interact with the global economy. Some of these countries depend upon foreign assistance, and the lack of transparency and binding nature of this funding has had little impact on developing such countries' infrastructure. As a result, in order to finance their infrastructure projects, these countries must select the most acceptable financing option for their circumstances. The national budget constraint, inadequate local financial markets, the risk of foreign credits, and cultural and religious values in these countries are among the obstacles that contemporary financing methods present. Consequently, looking for alternative financing methods for these countries' infrastructure projects is critical. This paper intends to look at infrastructure financing methods and their challenges in Asian landlocked developing countries and evaluate Islamic finance as an alternative to conventional finance. The qualitative research method is used for this study. Furthermore, document analysis has been utilised as a data collection tool. First, the concepts of Islamic finance will be presented before moving on to the definitions and types of infrastructure. Afterwards, the conventional infrastructure financing methods, along with the shortcomings of these methods in Asian landlocked developing countries, will be discussed. Then the development of Islamic finance in Asian LLDCs will be studied. Finally, how Islamic finance addresses the challenges of conventional finance methods will be perused. The study found that the Islamic finance models, which are founded on the principle of shared income or risk sharing, can be implemented as an alternative to conventional finance in infrastructure financing. Public-private partnership (PPP) initiatives can be implemented effectively within the framework of Islamic financing concepts because the elements of the public-private partnership initiatives are congruent with Islamic finance principles. First of all, public-private partnership initiatives allow for risk sharing among project participants, including financiers. In addition, public-private partnership projects allow Islamic financiers to become project participants rather than just lenders. Following that, PPP infrastructure projects are by definition, free of speculation and gambling. Finally, project contracts are frequently well-specified and free of uncertainty. Besides this, creating financial inclusion and risk sharing in the framework of Islamic finance reduces the currency risk and the cost of financing and causes equitable distribution of wealth in society.

Keywords: Islamic Finance, Asian Landlocked Developing Countries, Infrastructure Financing Methods.

Asya'nın Karayla Çevrili Gelişmekte Olan Ülkeleri İçin Altyapı Finansmanı Alternatifi Olarak İslami Finans

Öz

Dünya genelinde, her birinin kendine özgü avantajları ve engelleri olan çeşitli altyapı finansman yöntemleri kullanılmaktadır. Temel olarak, bir finansman yönteminin avantaj ve dezavantajları, her ülkenin ekonomik sistemine, coğrafi konumuna, ekonomik bağımlılığına, siyasi koşullarına, kültür ve inançlarına bağlı olarak farklı şekilde ortaya çıkmaktadır. Bir finansman stratejisini bir ülkede kullanmak belirli koşullar altında faydalı olabilirken başka bir ülkede zararlı olabilir. Sonuç olarak, finansman yöntemlerinin yararlılığı ve etkinliği ülkelerin koşulları altında incelenmelidir. Coğrafi kısıtlamalar ve ekonomik bağımlılık açısından aynı kaderi paylaşan Asya'nın Karayla Çevrili Gelişmekte Olan Ülkeleri (LLDC/KÇGOÜ), tüm sektörlerde ciddi altyapı eksiklikleriyle boğuşmaktadır. Bu ülkeler gelişmekte olan bir ekonomiye sahip, büyük ölçüde tarıma bağımlı, zayıf bir yönetim yapısına sahip, örgütsüz ve zayıf mali piyasaları olan ve küresel ekonomiyle etkileşim için büyük ölçüde komşularının transit yollarına bağımlı olan ülkelerdir. Bu ülkelerden bazıları dış yardıma bağımlıdır ve bu finansmanın şeffaf olmaması ve bağlayıcı olma niteliği, bu ülkelerin altyapısını geliştirmede çok az etkiye sahip olmuştur. Sonuç olarak, altyapı projelerini finanse edebilmek için bu ülkelerin kendi koşullarına en uygun finansman seçeneğini seçmeleri gerekmektedir. Ulusal bütçe kısıdı, yerel finans piyasalarının yetersizliği, dış kredi riski ve bu ülkelerdeki kültürel ve dini değerler, çağdaş finansman yöntemlerinin önündeki engeller arasındadır. Sonuç olarak, bu ülkelerin altyapı projeleri için alternatif finansman yöntemlerinin araştırılması kritik önem taşımaktadır. Bu çalışma, denize kıyısı olmayan gelişmekte olan Asya ülkelerindeki altyapı finansman yöntemlerini ve bunların zorluklarını incelemeyi ve İslami finansın geleneksel finansmana bir alternatif olup olmayacağını değerlendirmeyi amaçlamaktadır. Bu çalışmada, nitel araştırma yöntemine kullanılmıştır. Ayrıca veri toplama aracı olarak doküman analizinden yararlanılmıştır. İlk olarak, altyapı tanımlarına ve türlerine geçmeden önce İslami finans kavramları sunulacaktır. Daha sonra, geleneksel altyapı finansman yöntemleri ve bu yöntemlerin Asya'nın denize kıyısı olmayan gelişmekte olan ülkelerindeki eksiklikleri tartışılacaktır. Daha sonra Asya'daki LLDC/KÇGOÜ'lerde İslami finansın gelişimi incelenecektir. Son olarak, İslami finansın geleneksel finans yöntemlerinin zorluklarını nasıl ele aldığı incelenecektir. Çalışma, gelir ortaklığı veya risk paylaşımı ilkesine dayanan İslami finans modellerinin altyapı finansmanında geleneksel finansa alternatif olarak uygulanabileceğini ortaya koymuştur. Kamu-özel sektör ortaklığı (PPP/KÖO) girişimleri İslami finansman kavramları çerçevesinde etkin bir şekilde uygulanabilir. Çünkü KÖO girişimlerinin unsurlarının İslami finans ilkeleriyle uyumlu olduğu gözlenmektedir. Her şeyden önce, KOÖ girişimleri, finansörler de dahil olmak üzere proje katılımcıları arasında risk paylaşımına izin verir. Buna ek olarak, KÖO projeleri İslami finansörlerin sadece kredi vermek yerine proje katılımcıları haline gelmesine olanak tanımaktadır. Bunu takiben, KÖO altyapı projeleri tanımı gereği spekülasyon ve kumardan uzaktır. Son olarak, proje sözleşmeleri genellikle iyi belirlenmiş ve belirsizlikten uzaktır. Bunun yanı sıra, İslami finans çerçevesinde finansal kapsayıcılık ve risk paylaşımı yaratmak, kur riskini ve finansman maliyetini azaltmakta ve toplumda refahın adil dağılımına neden olmaktadır.

Anahtar Kelimeler: İslami Finans, Karayla Çevrili Asya Ülkeleri, Altyapı Finansman Yöntemleri.

1. INTRODUCTION

Infrastructure is the backbone of a country's economy and is essential to its economic growth and competitiveness. Infrastructure includes not only physical structures such as bridges, roads, and water and electricity systems but also a wide range of services from the health sector to education and from the cultural sector to public utility amenities.

There are three primary methods for financing infrastructure: public finance, corporate finance, and project finance. In public finance, the government provides financial resources for infrastructure projects. Most of these resources are tax revenues, but governments might take credits or issue bonds and official development assistance if tax revenues are insufficient. Infrastructure projects are funded as part of a company's balance sheet in corporate finance. This means that there is no distinction between the project debts and the company's other liabilities, and if the project fails, the company will be accountable to creditors with all its assets. In this approach, the company can issue shares, preferred shares, and corporate bonds and take corporate loans as a financing instrument. But in project finance, the financial structure is a non-recourse or limited recourse. The debt and equity used to finance the project are paid back from the cash flow generated by the project rather than from the general assets or creditworthiness of the project sponsors. In this approach, a special purpose vehicle (project company) is established by a number of companies involved in the infrastructure project, and all project obligations are delegated to that entity. In project finance, the capital contributed by private sector sponsors, the government's participation shares and subsidies, project loans, project bonds, and hybrid instruments are funding sources.

In addition to these three ways of financing, some nations use crowdfunding, green bonds, and infrastructure investment funds. However, the conventional financial system is based on interest. More specifically, the provided financial resources are subject to a predetermined interest rate payment. The existence of interest rates makes financial resources inaccessible to small economic sectors and reduces financial inclusion. On the other hand, if the loans come from international markets, they are subject to currency risk because the loan is in foreign currency, while the return on investment is in the national currency.

This difficulty is more pronounced in Asian landlocked developing countries, which have embryonic economies, inadequate financial markets, high reliance on neighbouring countries, and severe infrastructure gaps. Due to the lack of proportion and the inadequacy of these countries' domestic financial markets, the potential of funding from local markets is quite limited. As a result, these countries are turning to overseas loans, where currency risk is unavoidable. Unfavourable economic conditions, political changes, and high investment risk, on the other hand, raise the cost of funding and reduce financial inclusion.

In this paper, Islamic finance, which has taken on a practical aspect since the mid-1970s, is offered as an alternative to conventional financing systems. Theoretically, the foundation of this system is risk sharing. It means that the financier participates in the profits and losses of the financed projects. As a consequence, since there is no interest rate, small and medium enterprises also have access to financial resources, and as a result, the amount of investment increases. On the other hand, profit and loss participation reduces currency risk because the financing yield is calculated based on the number of outcomes from the financed project rather than the fixed interest rate. The capability of public-private partnership contracts under the Islamic financial system eliminates harmful competition between private and public enterprises.

This paper, therefore, aims to look at infrastructure financing methods and their challenges in Asian landlocked developing countries and evaluate Islamic finance as an alternative to conventional finance. The qualitative research methodology is used for this study. Furthermore, document analysis has been utilised as a data collection tool. The paper is organised as follows. Section 4. discussed the concept of Islamic finance. Section 5. and 6.

introduces infrastructure and its classification. Section 7. provides information about the methods of infrastructure financing. Sections 8. and 9. talk about Asian landlocked developing countries, their infrastructure needs and the challenges of conventional financing methods for funding their infrastructure. Section 10. and 11. discussed the development of Islamic finance in Asian LLDCs and how Islamic finance addresses the shortcomings of conventional financing methods. The study ends with a conclusion.

2. LITERATURE REVIEW

This paper focuses on two points in particular. Firstly, review the challenges of conventional financing methods in financing infrastructure in Asian landlocked developing countries. Secondly, investigate Islamic finance as an alternative to the conventional financing methods for infrastructure projects in Asian LLDCs. Asian landlocked developing countries are experiencing a significant gap in their infrastructure. The method of financing infrastructure is seen as one of the most pressing issues in these countries. This study proposes the Islamic finance model as an alternative to conventional financing. Conventional infrastructure financing approaches in Asian landlocked development countries encounter significant challenges. According to the United Nations- The Economic and Social Commission for Asia and the Pacific (ESCAP) (2020), infrastructure financing challenges are reviewed in two parts as public and private. Fiscal and balance of payments deficits, public debt issues, inefficient tax administrations, and the lack of efficacy in relation to public spending on infrastructure are all major challenges in infrastructure financing for the public sectors in LLDCs. The undesirability of the business environment, lack of transparency and predictability of the procurement regime, state-owned enterprises and the competition regime with the private sector, and financial and political risks in the financial sectors are the main challenges in infrastructure financing for the private sector in LLDCs.[1] According to Emenike Kalu O. (2015), infrastructure financing challenges are listed as currency risk, long-term risky revenue expectation, lack of bankable projects, inadequate legal and regulatory framework for infrastructure financing and high cost of projects.[2]

Various studies discussed using Islamic finance for infrastructure project financing. COMCEC (2019) report discusses this matter from a theoretical perspective and focuses on Indonesia, Malaysia, Sudan, Saudi Arabia, and the UK as a case study.[3] Kaplan examines the potential for Islamic finance to be used in Tukey for project financing. He concludes that Turkey has substantial potential; however, it must develop its legal and regulatory environment and increase awareness towards Islamic finance.[4] Sadikot investigates the Equate Project in Kuwait and discusses other alternatives and risks for using Islamic finance in this project.[5] Biancone and Shakhatreh evaluate the possibility of using Islamic finance for project financing in non-Muslim countries and conclude that sukuk can be a good alternative for the market.[6] Similarly to this study, AbdulKareem and Mahmud emphasise the importance of using sukuk for infrastructure financing.[7] Abdullah et. al. discuss possible risks when using

1 United Nations-ESCAP, Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities (Bangkok, 2020), 12–17.

2 Emenike Kalu O., "Infrastructure Finance Mechanism and Challenges in Nigeria," Independent Journal of Management & Production 6/3 (2015), 827–836.

3 COMCEC Coordination Office, *Infrastructure Financing through Islamic Finance in the Islamic Countries* (Ankara, 2019).

4 Fikri Kaplan, "Using Islamic Finance for Infrastructure Projects in Turkey: A Study of the Potentials, Challenges and Current Situation," *Finansal Piyasaların Evrimi: Bankacılık, Risk Yönetimi, Piyasa*, ed. Buket Altunkeski Kırcı - Mehmet Fatih Buğan (Gaziantep: Özgür Yayınları, 2023), 153–166.

5 Rishad Sadikot, "Islamic Project Finance: Shari'a Compliant Financing of Large Scale Infrastructure Projects," *Al Nakhlah: Online Journal on Southwest Asia and Islamic Civilization* Spring (2012), 1–9.

6 Paolo Pietro Biancone - Mohammad Ziad Shakhatreh, "Using Islamic Finance for Infrastructure Projects in Non-Muslim Countries," *European Journal of Islamic Finance* 2/2 (2015), 1–8.

7 Ibraheem Alani Abdulkareem - Mohd Sadad Mahmud, "Infrastructure Project Financing Through Sukuk as an Alternative to Conventional Bond Financing," *Journal of Management and Operation Research* 1/19 (2019), 1–11.

sukuk for project financing. They indicate that several risks may occur depending on the sukuk structure.[8]

Ayub emphasises that even the conventional financial industry centres ethics and moral implications for infrastructure finance, such as value-based intermediation (VBI), environmental, social and governance (ESG) criteria and corporate social responsibility (CSR). He indicated that Islamic financial institutions should focus more on VBI, ESG and CSR values aligned with the maqasid al-shariah principles. He asserts that infrastructure financing is one of the ways to serve this aim.[9]

Both Islamic and conventional finance supposedly carry out the task of bringing together fund providers and fund seekers to boost the economy. It is often suggested that Islamic and conventional finance are similar to the extent that most Islamic finance contracts can be changed to conventional finance contracts with only minor amendments. It seems that both Islamic and conventional finance give rise to an imbalance in the economy and work against vulnerable people, and this is considered a social failure of Islamic finance. However, numerous studies claim that Islamic finance can be a viable alternative to conventional finance. According to Diallo and Gundogdu (2021), Islamic finance comes up with Zakat and Waqf to address social failures; the nature of Islamic finance itself is a way to protect vulnerable people and bring about fairness to finance. The Islamic proposition for poverty alleviation is to have Waqf for social infrastructure development such as health, education, and water and zakat for wealth redistribution. Moreover, Islamic finance principles indicate that some infrastructure development projects should not be carried out using banking services.[10]

According to Naweed Ahmad Lone (2019), the lack of financial inclusion in the conventional financing system causes an economic imbalance and unequal wealth distribution. But Islamic finance addresses the issue of financial inclusion from two directions – one through promoting risk-sharing contracts that provide a viable alternative to conventional debt-based financing, and the other through specific instruments of wealth redistribution among the society like zakat.[11] Financial inclusion is essential to developing Islamic finance; without that, using it in infrastructure finance would be challenging.

Consequently, most studies focus on using Islamic finance for infrastructure projects by considering sukuk and evaluating issues from this perspective. On the other hand, some studies focus on Islamic finance in Central Asia;[12] however, there is a crucial gap in studies focusing on Islamic finance for infrastructure financing for Asian LLDCs. This study aims to contribute to filling this gap in the literature by examining Asian LLDCs not only for infrastructure financing challenges but also for providing possible "Islamic finance"s solutions.

3. RESEARCH DESIGN AND METHODOLOGY

The paper adopted an exploratory approach to identify issues regarding using Islamic finance as a tool for financing infrastructure projects in Asian LLDCs. Considering the study's exploratory nature, the qualitative research method is used. There are very few studies focused on the development of Islamic finance in Asian LLDCs. For this reason, this paper is

8 Abdul Aziz Abdullah et al., "Risk in Funding Infrastructure Projects through Sukuk or Islamic Bonds," *International Review of Management and Business Research* 3/2 (2014), 915–928.

9 Muhammad Ayub, "Focusing Project Financing for Growth and Realizing the Higher Objectives of Shar̄ı'Ah," *Journal of Islamic Business and Management (JIBM)* 09/02 (2019), 235–247.

10 Amadou Thierno Diallo - Ahmet Suayb Gundogdu, *Islamic Financial Product Development in the Context of Education and Health*, 2021, 21–22.

11 Naveed Ahmad Lone, "Islamic Finance: An Alternative Approach to Financial Inclusion," *Insight Islamicus* 19/ (2019), 159–160.

12 Geoffrey F. Gresh, "The Rise of Islamic Banking and Finance in Central Asia," *Al Nakhlah* Fall (2007); Ruslan Nagayev - Rashed Jahangir, *Islamic Finance in Central Asia and Russia* (Istanbul, 2022).

considered an initial study in this area. The qualitative research method is best suited for exploratory studies.[13] The study uses previous research articles, reports, journals and related web sources as data sources and analyses from a qualitative perspective.

The study attempts to answer the following research questions:

- What are the challenges for infrastructure project financing in the Asian LLDCs?

- Can Islamic financing methods be an alternative to financing infrastructure projects in the Asian LLDCs?

Therefore, the paper aims to look at infrastructure financing methods and their challenges in Asian landlocked developing countries and evaluate Islamic finance as an alternative to conventional finance. To address research questions, we explained the basic concepts of Islamic finance and infrastructure financing methods to provide a better understanding of these concepts. Then, we elaborated on the current infrastructure needs in the Asian LLDC and the challenges of the existing financing methods. Finally, we provided the development of Islamic finance in the Asian LLDCs to answer whether Islamic finance can used as an alternative financing method for infrastructure projects.

4. THE CONCEPT OF ISLAMIC FINANCE

Islamic finance is a financial system based on Islamic law (which is also referred to as shariah). Islamic financial principles are based on the basic notion of caring for the welfare of the public by preventing unfair or exploitative actions. The stringent prohibition on giving or receiving any fixed, predefined rate of return on financial transactions is the most well-known feature of the Islamic financial system.[14] More specifically, the principles of Islamic finance are as follows:[15]

- Returns should be related to profits/earnings and derived from the financier's business risk.
- Islamic financiers are project partners.
- Transactions should not involve speculation or gambling (maysir).
- Investments in illegal goods and activities, such as alcohol, gambling, and weapons, are prohibited.
- The presence of undue uncertainty in a contract is banned.

Until the very beginning of the 1970s, Islamic finance was an academic concept that few people knew about; today, it is a well-known practical reality. Despite an unfriendly context and without the support of the supplementary or collaborating organisations essential for its successful operation, it developed as an innovative method of financial intermediary in the 1980s. Its global acceptance is based on its use and feasibility. It has also aroused the attention of major international financial institutions, regulators such as the Federal Reserve Board and the Financial Services Authority of England, international financial institutions such as the IMF and the World Bank, and highly regarded centres of learning like Harvard University in the United States, the London School of Economics and Durham University in the United Kingdom and some other educational centres in Saudi Arabia, Malaysia, Pakistan and Egypt. Islamic finance is practised in approximately 75 countries around the world, with over 550 Islamic financial institutions. Numerous worldwide organisations and regional financial centres are assisting in standardising Islamic banking products, thereby strengthening their credibility. Nearly all global conventional finance organisations provide Islamic financial services through explicitly designated subsidiaries or windows. It is an optimistic indication of an emerging good as well as a moral enterprise that will improve the welfare and peace of mind of millions

[13] John W Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (Boston, MA: Pearson, 2012), 16.

[14] Lone, "Islamic Finance: An Alternative Approach to Financial Inclusion," 158–159.

[15] COMCEC Coordination Office, *Infrastructure Financing through Islamic Finance in the Islamic Countries*, 44.

of people who have been either refusing to participate in the conventional financial system or feeling guilty due to the engagement of interest in their transactions, which is alternatively forbidden in all revealed religions.[16]

As a finance toolkit, there are multiple choices under the scope of Islamic finance. Table 1 shows the major structures based on the underlying financial contracts.[17]

Table 1. Financing Models in Islamic Finance

Contract Type	Finance Model	Brief Definition
Asset-Based	Ijarah (Leasing)	A contract in which one party (the lessee) acquires the usufruct right of the property belong to the other party (the lessor) at a certain price in a certain period of time.
Sale-Based	Murabahah (Cost-Plus)	A contract to sell a commodity or property at a fixed interest rate in exchange for an upfront or postponed payment.
	Istisna	A contract to manufacture items, assemble or process them, or build something based on precise measurements and within a specific time frame. Payment is made while the property's work is being completed.
Equity-Based	Musharakah (Joint Venture)	An agreement among more than one party to form a capital-and-labour-based commercial entity. Profit and loss are divided according to an agreed-upon ratio based on the amount invested.
	Mudarabah (Profit and Loss Sharing)	A contract between two parties in which one party contributes capital and the other contributes labour due to form a partnership and share earnings in predetermined ratios.
Certificate-Based	Sukuk	Financial instruments that represent an undivided ownership interest in the assets or interests of the issuer.

Source: World Bank Group, The Public–Private Infrastructure Advisory Facility (PPIAF) and The Islamic Development Bank (IsDB), Reference Guide: Islamic Finance for Infrastructure PPP Projects (Washington DC, 2019), 9.

5. THE CONCEPT AND DEFINITION OF INFRASTRUCTURE

Infrastructure is a compound term made up of two words: "infra" and "structure". As a dictionary meaning, it is defined as “the structure that forms the basis of a system or organisation”.[18] "Infra" comes from the Latin language, which means "below",; "infrastructure" can be applied to mean "foundation".[19] As a result, the infrastructure term refers to the basic or basis of a system.[20]

Although infrastructure has come a long way as a concept, academic studies have no common definition. Therefore, different substantial and dependable definitions will be

16 Muhammad Ayub, *Understanding Islamic Finance* (West Sussex: John Wiley & Sons, 2007), 15.
17 World Bank Group et al., *Reference Guide: Islamic Finance for Infrastructure PPP Projects* (Washington DC, 2019), 9.
18 Coşkun Can Aktan - Dilek Dileyici, “Genel Olarak Altyapı Hizmetleri,” *Altyapı Ekonomisi: Altyapı Hizmetlerinde Serbestleşme ve Özelleştirme* (Ankara: Seçkin Yayınları, 2005), 6.
19 Walter Buhr, *What Is Infrastructure?* (Volkswirtschaftliche Diskussionsbeiträge, Universität Siegen, Fakultät Wirtschaftswissenschaften, Wirtschaftsinformatik und Wirtschaftsrecht, 2003), 1.
20 Brett M. Frischmann, *Infrastructure: The Social Value of Shared Resources* (Oxford University Press, 2012), 3.

introduced in the following sections, and an intermediate definition will be presented for comparison.

Reimut Jochimsen (1966) states, "Infrastructure is the totality of physical, institutional, and personal facilities available to economic agents that, in the case of an efficient allocation of resources, equalise compensation for equivalent inputs".[21]

According to Walter Buhr (2003), "Infrastructure includes all relevant economic information, such as regulations, stocks, and measures to maximise the economic potential of economic actors".[22]

As defined by the OECD (2015), infrastructure refers to broad types of assets that create public goods and services required for economies to function and expand.[23]

To be honest, the above definitions only take into account one aspect of infrastructure. In some of these definitions, infrastructure is considered entirely material or tangible assets, whereas in others, it is described as intellectual or intangible. As a result, the term of infrastructure has two distinct meanings: narrow and broad. In a restricted sense, infrastructure encompasses the material facilities such as transportation, communication, electricity, and water required to operate an investment. In a broad sense, infrastructure includes institutions in the sectors of education and health, as well as financial or economic opportunities and social fixed capital that includes knowledge and skills connected to these issues.[24] Briefly, infrastructure is a concept with both economic and social implications.[25]

Finally, if a functional or intermediate definition of infrastructure is provided, Chong and Poole's (2001) definition can be used. Chong and Poole define "infrastructure" as "the structure and facilities required for the economy and society to function". Rather than being an aim, infrastructure facilitates economic activity and social services.[26]

6. CLASSIFICATION OF INFRASTRUCTURE

Infrastructure classification has no single approach like its definition.[27] Infrastructure has been classified from several angles. For example, Jochimsen (1966) classified infrastructure into three parts: material infrastructure (transport system, utilities, health, education, etc.), personal infrastructure (human capital), and institutional infrastructure (norms, institutions, and procedures), whereas Jacobs Sturms et al. (1995) classified infrastructure into two categories: basic infrastructure (roads, canals, ports, etc.) and auxiliary infrastructure (trams, gas, electricity, water supply, etc.).[28] But here we look over N. M. Hansen's (1965) approach, which is the most cited in academic research and the US Congressional Budget Office's 2008 and 2009 infrastructure definitions is based on it. According to N. M. Hansen (1965), infrastructure is classified into two types: economic and social. Economic infrastructure refers to structures and facilities that are required for the basic operation of an economy and directly support productive activities. Such structures include highways, seaways, airports, water, gas, power distribution networks, irrigation and sewerage networks, dams, etc.

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21 Gianpiero Torrisi, *Public Infrastructure: Definition, Classification and Measurement Issues* (Munich, Germany, 2009), 6–7.

22 Buhr, *What Is Infrastructure?*, 16.

23 Raffaele Della Croce et al., *Infrastructure Financing Instruments and Incentives* (Paris, 2015), 7.

24 Aktan - Dileyici, "Genel Olarak Altyapı Hizmetleri," 6.

25 Mustafa Tuna - Sevilay Bostancı, "Mahalli İdarelerde Altyapı Yatırımlarının Finansman Yöntemleri: Ankara Su ve Kanalizasyon İdaresi (ASKİ) Genel Müdürlüğü Örneği," *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi* 23/4 (2021), 1479.

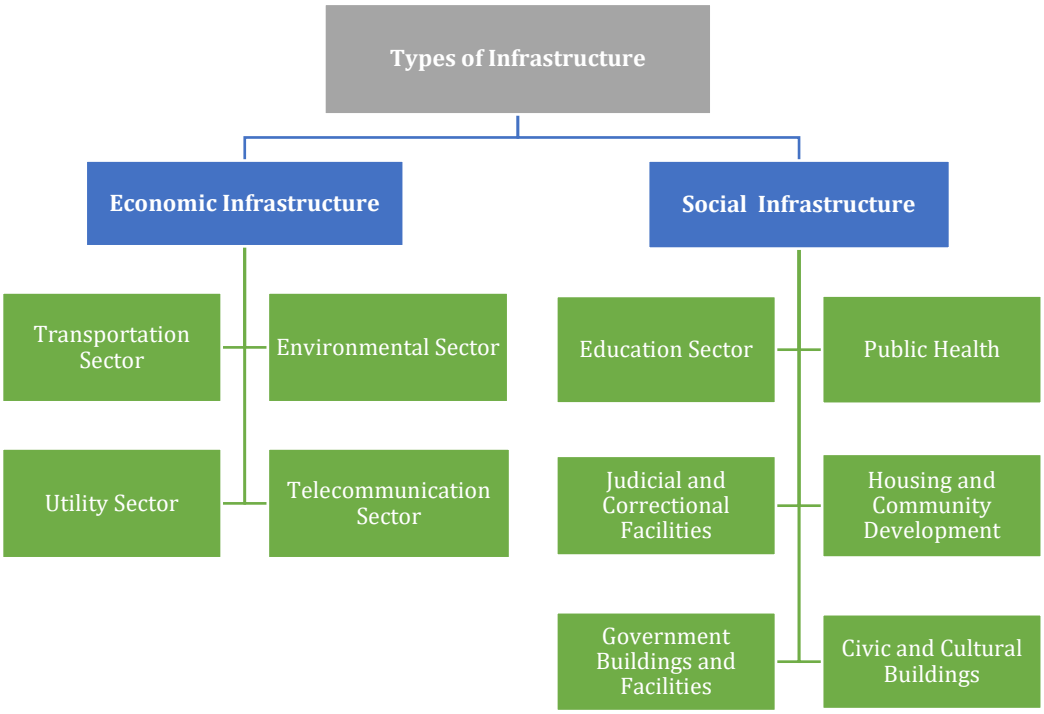
26 Sophia Chong - Emily Poole, *Financing Infrastructure: A Spectrum of Country Approaches*, 2013, 66.

27 Irina V. Baskakova - Nikita S. Malafeev, "The Concept of Infrastructure: Definition, Classification and Methodology for Empirical Evaluation," *Известия Уральского Государственного Экономического Университета* 3/71 (2017), 31.

28 Torrisi, *Public Infrastructure: Definition, Classification and Measurement Issues*, 10–16.

On the other hand, social infrastructure is a set of complementary facilities and structures designed to improve social comfort and quality of life while promoting economic efficiency. These are facilities such as hospitals, schools, environmental cleaning facilities, municipality offices, public safety structures, sports facilities, and green areas.[29] Figure 1 below provides further information about this classification.

Figure 1. Infrastructure Types and Components



Source: Can Chen - John R. Bartle, Infrastructure Financing: A Guide for Local Government Managers (2017) 4.

6.1. Economic Infrastructure

Economic infrastructure refers to the facilities, activities, and services that support the operation and development of other sectors of the economy. These facilities, activities, and services contribute to the economy's overall efficiency. Furthermore, the economic infrastructure, as an important aspect, promotes the seamless operation of all sectors of the economy. The economic infrastructure serves as the economic system's nerve centre. It is essential to the advancement of civilisation as well as the growth of the economy. Public facilities provide space and time utility to commodities and services. They also connect manufacturing, distribution, and end users. As a result, economic infrastructure connects the many components of the economy. Economic infrastructure refers to societal essentials such as railways, roads, ships, aeroplanes, communication, and so on. Hence, lacking these infrastructures and services may stifle its economic growth and make quick growth impossible.[30]

[29] Can Chen - John R. Bartle, *Infrastructure Financing: A Guide for Local Government Managers* (2017), 4; Torrisi, *Public Infrastructure: Definition, Classification and Measurement Issues*, 15.

[30] Namratha Reddy, "Economic Infrastructure – Intro, Types, Significance" (2018).

The following sectors are part of the economic infrastructure:[31]

- Transportation sector: surface transportation (highways, bridges, railways, and parking), public transportation (urban rail and bus rapid transit), aviation (airports, navigation aids), and water transport (inland and seaports)
- Environmental sector: Water distribution and treatment (drinking), treatment of wastewater (sewerage), garbage management, and pollution prevention facilities are all part of the environmental sector.
- Utility sector: includes electric power systems and gas distribution.
- Telecommunications sector: covers telecommunication cables and networks, as well as high-speed Internet.

6.2. Social Infrastructure

Social infrastructure includes facilities, spaces, services, and networks that improve our community's quality of life and well-being. It causes us to be happy, safe, and healthy, as well as to learn and be content with our lives. The social infrastructure network contributes to social identity, inclusion, and unity and is used by all sectors of society at some time in their life, frequently on a daily basis. Many social infrastructure facilities, such as public swimming pools, childcare centres, major hospitals, colleges, and art galleries, play a vital role in our daily lives. Access to high-quality, convenient social services directly impacts all individuals' economic and social welfare.[32]

The following six social sectors comprise social infrastructure:[33]

- Education sector: primary schools and facilities, university buildings and facilities
- Public health: healthcare facilities, hospitals
- Judicial and penal facilities: prisons, courts
- Housing and community development
- Government buildings and facilities: government administrative buildings, public security and welfare facilities
- Civil and cultural facilities: libraries, conference centres, parks and recreation areas

The government substantially covers the expense of social infrastructure. People who use a park, go to a public school, or get treatment at a public hospital do not pay the full cost of their use.[34]

7. FINANCING METHODS OF INFRASTRUCTURE PROJECTS

Infrastructure projects are frequently financed by governments. However, different methods and instruments might be used to finance these projects if the government's own resources are insufficient or the project is deemed economically feasible to be implemented by the private sector.[35] If infrastructure projects are carried out fully by governments, financial resources can be provided through bonds, local and foreign loans, and international aids, in addition to government resources. In general, all available resources are allocated to the infrastructure project within the budgetary limits, and this approach is called "public finance" in the literature.[36] Another alternative is for the government to transfer infrastructure projects to the private sector, namely to those who can best manage the project, through privatisation, to reduce the infrastructure project cost and boost project efficiency.[37]

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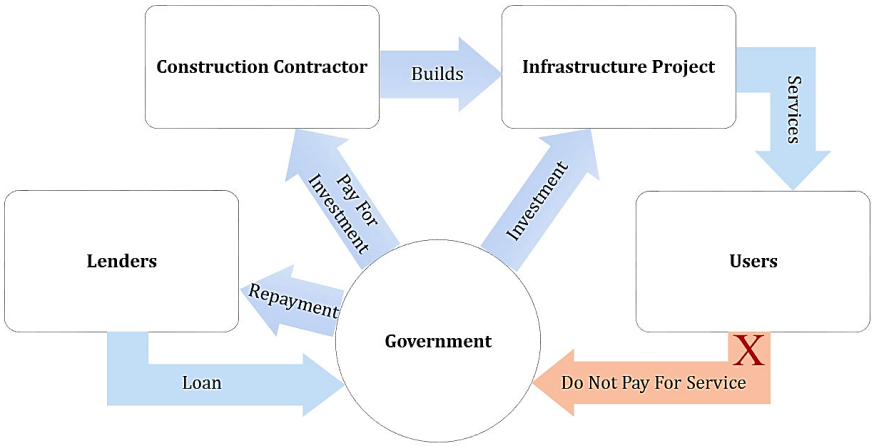
31 Chen - Bartle, *Infrastructure Financing: A Guide for Local Government Managers*, 4.
32 Infrastructure Australia, *An Assessment of Australia's Future Infrastructure Needs* (2019), 388.
33 Chen - Bartle, *Infrastructure Financing: A Guide for Local Government Managers*, 4.
34 Infrastructure Australia, *An Assessment of Australia's Future Infrastructure Needs*, 392–394.
35 Croce et al., *Infrastructure Financing Instruments and Incentives*, 7.
36 Erhan Bahtiyar, *Altyapı Yatırımlarının Mevcut Finansman Modelleri Ile Sukuk Finansman Modelinin Mukayeseli Analizi (Doktora Tezi)* (İstanbul Üniversitesi, 2021), 16; Erdoğan Irmak, *Kamu Yatırımları Finansmanı ve Altyapı Yatırımlarının Finansmanında Altyapı Yatırım Ortaklarının Kullanılması ve Değerlendirilmesi (Yüksek Lisans Tezi)* (Gazi Üniversitesi, 2010), 31.
37 COMCEC Coordination Office, *Infrastructure Financing through Islamic Finance in the Islamic Countries*, 19.

In this situation, the project is totally handed to the private sector, and finance sources can be provided through owner equity, preferred shares, corporate loans, corporate bonds, and convertible bonds. This type of financing is known as "Corporate Finance".[38] However, many infrastructure projects have features that necessitate government intervention.[39] Taking these characteristics into account, the "Public-Private Partnership" model emerges in order to improve project efficiency, reduce production costs, and make better use of production resources. As a result, the private sector is responsible for project financing, design, implementation, and operation. The public institution is only in charge of its oversight and management.[40] A new project company with legal status will be established as part of the PPP agreement. In addition to the sponsors' equity, loans and bonds can be utilised for financing the project company. This method is known as "Project Finance".[41] Other financing mechanisms, such as "Green bonds," "Infrastructure investment funds," and "Crowdfunding," are being used around the world alongside to the methods mentioned above.[42]

7.1. Public Finance

Public finance will be addressed when the government provides financing or investment funds for infrastructure projects. Typically, public institutions or state-owned enterprises are in charge of project planning, design, building, and operation in this context. [43] However, the private sector can also be involved in constructing infrastructure projects.[44] The public sector finances the majority of existing infrastructure developments around the world. Because the transfer of large-scale infrastructure projects to the private sector may result in monopolies and unreasonable price increases.[45] Another cause is that, since most infrastructure services are in high demand, public institutions prefer to provide such services in order to enhance public welfare.[46] The public finance method for infrastructure projects is shown in Figure 2.

Figure 2. Public Finance Model



38 Croce et al., *Infrastructure Financing Instruments and Incentives*, 18–19.
39 Chong - Poole, *Financing Infrastructure: A Spectrum of Country Approaches*, 66.
40 Tuna - Bostancı, "Mahalli İdarelerde Altyapı Yatırımlarının Finansman Yöntemleri: Ankara Su ve Kanalizasyon İdaresi (ASKİ) Genel Müdürlüğü Örneği," 1486.
41 COMCEC Coordination Office, *Infrastructure Financing through Islamic Finance in the Islamic Countries*, 23.
42 Chen - Bartle, *Infrastructure Financing: A Guide for Local Government Managers*, 14.
43 Chong - Poole, *Financing Infrastructure: A Spectrum of Country Approaches*, 66.
44 The Public-Private Infrastructure Advisory Facility, *Project Finance: Introductory Manual on Project Finance for Managers of PPP Projects* (2001), 6.
45 Serge Emile Eid, *Financing Infrastructure Projects* (American University of Beirut, 2008), 14.
46 Ahmet Gökhan Arsalan, *Altyapı Yatırımlarının Sermaye Piyasası Araçlarıyla Finansmanı ve Kurumsal Yatırımcılarının Rolü* (Gazi Üniversitesi, 2019), 38.

Source: Håvard Halland et al., *Resource Financed Infrastructure: A Discussion on a New Form of Infrastructure Financing* (Washington DC: International Bank for Reconstruction and Development/The World Bank, 2014), 21.

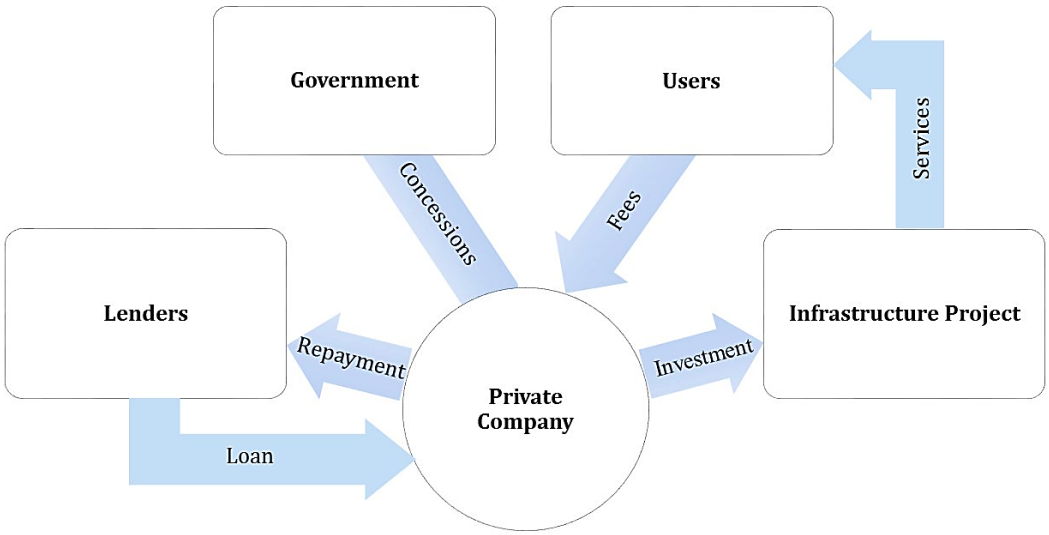
The main sources of public finance are general taxes, usage fees, foreign exchange reserves, official development assistance, domestic and foreign loans, and bonds.[47]

7.2. Private Finance

As previously stated, it is considered appropriate for the private sector to provide infrastructure products and services that are subject to market mechanisms. Moreover, economic infrastructure projects are carried out more efficiently by the private sector; as a result, governments transfer existing infrastructure projects through privatisation to the private sector.[48] Generally, private companies can use two methods to finance a project: corporate finance and project finance.[49]

Corporate finance, often referred to as on-balance-sheet finance, is used by corporations to finance a portion of the capital investment for a project using the company's balance sheet instead of the project itself. This mechanism is frequently used in lower-value projects where the cost of financing is insufficient to support a project financing mechanism or where the private operator is so large that it decides to fund the project from its own balance sheet. Assets are funded as part of a company's balance sheet in corporate finance.[50] This means that there is no distinction between the project debt and the company's other liabilities, and if the project fails, the company will be accountable to creditors with all of its assets.[51] The balance sheet finance model is shown in Figure 3.

Figure 3. Corporate Finance Model



Source: The Public-Private Infrastructure Advisory Facility, *Project Finance: Introductory Manual on Project Finance for Managers of PPP Projects*, [2001], 6.

47 COMCEC Coordination Office, *Infrastructure Financing through Islamic Finance in the Islamic Countries*, 23.

48 Hideo Nakamura et al., *Principles of Infrastructure: Case Studies and Best Practices* (Tokyo: Asian Development Bank Institute, 2019), 132.

49 Waskitha W. Galih - Ruslan Prijadi, "The Choice of Infrastructure Project Financing Strategies: A Case of A Seaport in Indonesia," *Proceedings of the 12th International Conference on Business and Management Research (ICBMR 2018)* (Atlantis Press, 2019), 118.

50 Sisira Lohawiboonkij, "The Best Project Financing Option for Infrastructure Projects in Developing Nations," *PM World Journal* VIII/I (2019), 6–7.

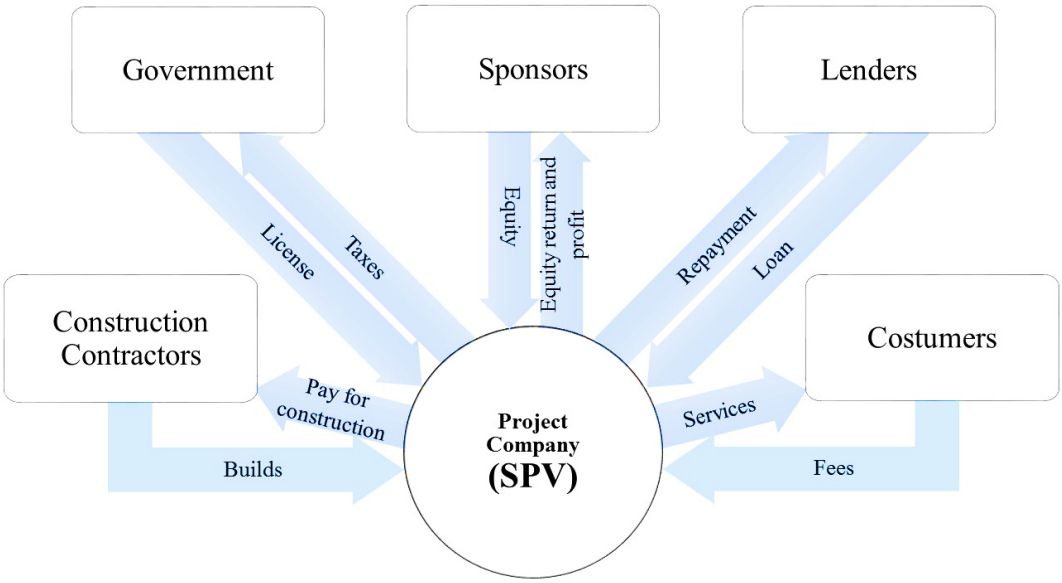
51 Galih - Prijadi, "The Choice of Infrastructure Project Financing Strategies: A Case of A Seaport in Indonesia," 118.

Corporate finance instruments include company equity, shares, preferred shares, corporate bonds, corporate loans, and hybrid Instruments.[52]

Project finance, also known as off-balance sheet finance or non-recourse finance, is a method that provides source of financing for the realisation of large infrastructure projects based on the assets and future cash flows of the project without expecting any collateral from the assets of the project sponsors.[53]

Within the context of project financing, investments in infrastructure projects are carried out by a few private enterprises in the form of joint ventures or with the participation of the government. Typically, loans are the most common form of financial source offered by banks and non-banking financial institutions.[54] The project finance model is shown in Figure 4.

Figure 4. Project Finance Model



Source: Halland et al., *Resource Financed Infrastructure: A Discussion on a New Form of Infrastructure Financing*, 23.

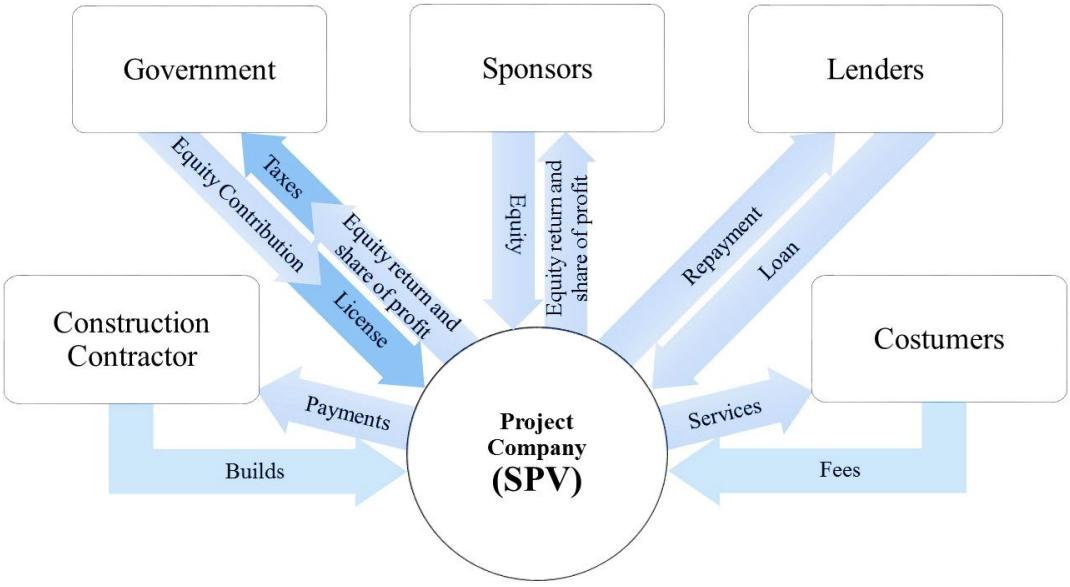
In terms of project finance, the majority of infrastructure projects are public-private partnerships (PPP).[55] Public-private partnership (PPP) is a long-term agreement between the private sector and government agencies to provide a public good or service.[56] The main reason for PPP is that it allows infrastructure projects to be developed quickly, effectively, and efficiently by combining the public and private sectors and sharing capital, earnings, and loss.[57]

In this approach, public institutions, as the developers of infrastructure services, delegate responsibility and execution of state-owned projects that are still in operation or are being designed for the private sector for a limited time. In another case, the government

52 Croce et al., *Infrastructure Financing Instruments and Incentives*, 18–19.
53 Sharifah Nurul Azlin bt Syed Mohd Bakhor, *Sukuk as a Means of Project Financing* (2013), 4.
54 The Public-Private Infrastructure Advisory Facility, *Project Finance: Introductory Manual on Project Finance for Managers of PPP Projects*, 9; Lyudmila N. Voropaeva - Tatiana V. Yurieva, "Project Finance: Principles and Efficiency," *8th International Scientific Conference on Project Management in the Baltic Countries* (Riga: University of Latvia, 2019), 106.
55 Bakhor, *Sukuk as a Means of Project Financing*, 5.
56 Chong - Poole, *Financing Infrastructure: A Spectrum of Country Approaches*, 67.
57 Bakhor, *Sukuk as a Means of Project Financing*, 5; Voropaeva - Yurieva, "Project Finance: Principles and Efficiency," 106.

transfers its own land or other assets to a project firm in exchange for a stake in the company.[58] Figure 5 depicts the project financing model.

Figure 5. PPP Model of Project Finance



Source: Halland et al., *Resource Financed Infrastructure: A Discussion on a New Form of Infrastructure Financing*, 27.

In project finance, the assets contributed by private sector sponsors, the government's participation share and subsidies, project loans, project bonds, and hybrid instruments are funding sources.[59]

7.3. Other Financing Methods in Use

• **Green Bonds:** Green bonds are debt instruments issued to finance "green projects" with specific environmental benefits, typically linked to climate change.[60] Green projects are listed in broader categories in the latest edition of the Green Bond Principles (2021). Renewable energy, energy efficiency, pollution prevention and control systems, sustainable management of natural resources and land use, conservation of terrestrial and aquatic biodiversity, clean transportation, sustainable water and wastewater management, sustainable agriculture, and environmentally conscious buildings are among these categories.[61] Green bonds can be issued by banks, governments, municipalities, financial institutions, companies, or SPVs.[62]

• **Infrastructure investment funds:** An infrastructure investment fund is an enterprise that pools the financial resources of large investors such as pension funds, sovereign wealth funds, private insurance companies, and investment banks which employs experienced fund managers to invest the funds in various infrastructure assets. The infrastructure fund's primary source of finance is institutional investors.[63] In this model, the

58 Håvard Halland et al., *Resource Financed Infrastructure: A Discussion on a New Form of Infrastructure Financing* (Washington DC: International Bank for Reconstruction and Development / The World Bank, 2014), 26–27.

59 Halland et al., *Resource Financed Infrastructure: A Discussion on a New Form of Infrastructure Financing*, 26–27; The Public-Private Infrastructure Advisory Facility, *Project Finance: Introductory Manual on Project Finance for Managers of PPP Projects*, 9–10.

60 World Bank, *What Are The Green Bonds?* (Washington DC, 2015), 23.

61 ICMA Paris Representative Office, *Green Bond Principles: Voluntary Process Guidelines for Issuing Green Bonds* (Paris, 2021), 4–5.

62 Croce et al., *Infrastructure Financing Instruments and Incentives*, 26–27.

63 Chen - Bartle, *Infrastructure Financing: A Guide for Local Government Managers*, 22.

fund manager is in charge of infrastructure assets evaluation and investment transactions on behalf of the investors, while individual and institutional investors who receive contributions from the fund can invest directly in infrastructure assets.[64]

• **Crowdfunding:** Crowdfunding is a method of raising modest sums of money from a large number of people. This strategy has grown in popularity as an inventive and trendy way to fund relatively small urban infrastructure projects, frequently through fundraising. Crowdfunding connects enterprises in need of capital with private investors ready to invest small sums via an internet-based (online platform). According to current practices, this strategy has successfully financed municipal small infrastructure projects.[65]

8. ASIAN LANCLOCKED DEVELOPING COUNTRIES AND THEIR INFRASTRUCTURE NEEDS

The term "landlocked developing countries" (LLDCs) refers to nations without a maritime border. When compared to coastal nations, LLDCs experience significantly higher transport and other trade transaction costs because of their distance from global markets, multiple border crossings, complicated transit procedures, ineffective logistics systems, weak institutions, and inadequate infrastructure. They are at a disadvantage in fully utilising their potential to support their sustainable development efforts because of these high costs, which have a significant trade-reducing effect and have a direct negative impact on economic growth.[66]

The LLDCs depend on their transit neighbours geographically, particularly on their infrastructure, security and stability regulations, administrative procedures, and cross-border political contacts. While some countries, especially countries in Central Asia, heavily depend on surface transportation to connect with their major trading counterparts, others, such as those with greater indirect access to maritime services and global markets, rely more on maritime services and global markets. The premise that constructing adequate transportation infrastructure will facilitate access to international markets appears to dominate most analyses of the economic issues confronting LLDCs.[67]

The United Nations lists 32 countries as landlocked developing countries (LLDCs), including 16 in Africa, 12 in Asia, 2 in Europe, and 2 in Latin America. They all share two specific characteristics, as the name of the group suggests: they are all developing nations without direct access to the sea.[68]

Asia's LLDCs include countries with varying total and per capita GDP, land areas, population density, and varying levels of infrastructure development and financing capacity. LLDCs in Asia can be divided into two groups based on their overall development and historical disposition: 1) countries with transition economies (the former Soviet LLDCs and Mongolia); and 2) Least Developed Countries (LDCs).[69] Afghanistan, Armenia, Azerbaijan, Bhutan, Kazakhstan, Kyrgyzstan, the Democratic Republic Lao (Lao PDR), Mongolia, Nepal, Tajikistan, Turkmenistan, and Uzbekistan are among the 12 Asian LLDCs.

The financing resources required to close infrastructure gaps in LLDCs have been estimated to be 10.5 per cent of their respective GDP. Many infrastructure facilities, such as roads, bridges, power generation and transmission lines, airports, water supply and sanitation, Internet access, and other telecommunications networks, are heavily reliant on

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64 Arsalan, *Altyapı Yatırımlarının Sermaye Piyasası Araçlarıyla Finansmanı ve Kurumsal Yatırımcılarının Rolü*, 66.

65 Chen - Bartle, *Infrastructure Financing: A Guide for Local Government Managers*, 23.

66 UN-OHRLLS, *Landlocked Developing Countries Fact Sheet 2020* (2020), 1.

67 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 7–8.

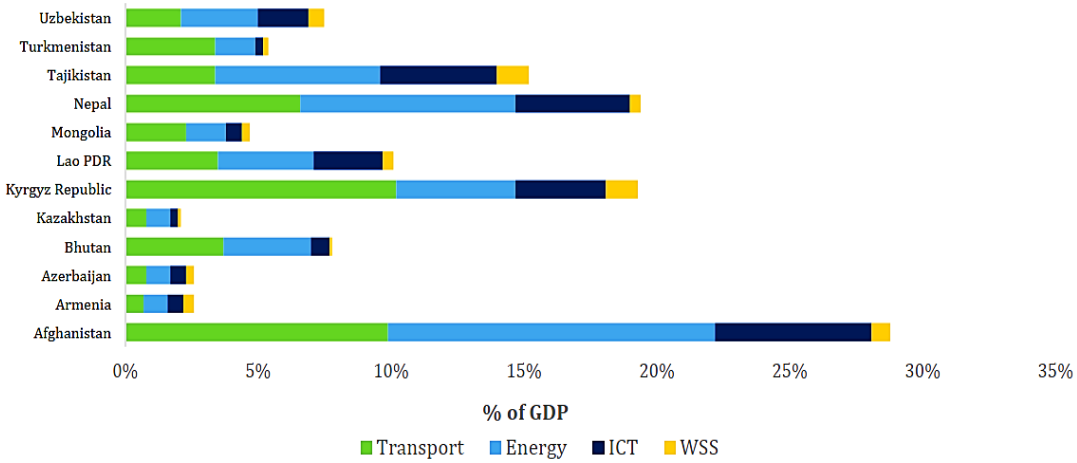
68 UNCTAD, *Economic Diversification in Selected Asian Landlocked Developing Countries (Bhutan, Kazakhstan, Mongolia, and Turkmenistan): Challenges, Policy Options, and the Way Forward* (Geneva: United Nations, 2020), 6.

69 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 7–8.

these countries and have significant funding gaps. Future prosperity is unquestionably dependent on investments in effective infrastructure. However, infrastructure constraints limit access to regional and global markets, reducing export competitiveness and stifling economic growth.[70]

Afghanistan has the highest infrastructure financing needs among the region's LLDCs (up to 29 per cent of GDP), followed by Nepal and Kyrgyzstan (up to 19 per cent of GDP) (figure 6). The transportation and energy sectors require the most investment, followed by information and communications technology (ICT) and water supply and sanitation (WSS).[71]

Figure 6. Infrastructure financing needs in Asian LLDCs (2018-2030)



Source: United Nations-ESCAP, Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities (Bangkok, 2020), 14.

9. CHALLENGES OF INFRASTRUCTURE FINANCING METHODS IN ASIAN LLDCs

The Economic and Social Commission for Asia and the Pacific (ESCAP) reported that in 2017 65% of infrastructure projects in countries with special needs (CSN) were funded by public finance. 10% came through loans from multilateral development banks (MDBs), and 15% from the private sector, including foreign direct investments (FDI) and public-private partnership models. On average, official development assistance (ODA) was expected to provide the final 10%. At the same time, less than 30% of infrastructure projects in developed countries are sponsored by the government.[72]

Given the infrastructure funding imbalance in the nations mentioned above, it is evident that all forms of funding, including public, private, domestic, and international, will be required. However, the significance and functions of different finance sources may vary from one nation to another and from one industry to another. However, Asian LLDCs make it more challenging to achieve their infrastructure needs because of widespread limitations on foreign investment as well as issues with both public and private funding sources.[73]

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70 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific* (Bangkok, 2019), 159–160.

71 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 159–162.

72 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 9.

73 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 9–12.

9.1. Challenges in Public Finance Methods

On a worldwide scale, most of the resources for infrastructure investments in LLDCs come from the public sector, notably government budgets. Countries use a variety of methods for allocating public resources. For instance, non-tax income, such as natural resources, funds at least half of government budgets in resource-rich LLDCs, whereas tax revenues fund the majority of public spending in other LLDCs.[74]

The main concerns of public finance used in infrastructure projects in LLDCs are fiscal and balance-of-payments deficits, public debt issues, insufficient tax administration, and inefficient public spending on infrastructure projects.[75] Despite significant infrastructure financing requirements, most LLDCs have lower capital expenditures (mostly in infrastructure) than the global average. In non-resource-rich LLDCs, tax revenues are the principal source of public resources. However, these levies are inadequate and insufficient due to inefficient tax management systems and the presence of a sizable informal sector. On the other hand, individual capital owners' tax avoidance is regarded as a problem. The emergence of fiscal and current account balance deficits, or "twin deficits," poses a key difficulty in this situation, reducing infrastructure financing capacity and converting LLDCs into net debtors.[76]

In this setting, the occurrence of fiscal and current account balance deficits, or "twin deficits," provides a key challenge and constraint. As a result, for some Asian LLDCs, specifically those with "twin deficits," using sovereign debt as a possible source of infrastructure finance may be out of the question. At the same time, infrastructure expansion without incurring debt may simply be impossible for some countries: unlike private firms, governments cannot issue equity. For many Asian LLDCs, public debt financing may be the sole option, however unpalatable.[77]

Besides that, currency risk is an important component of infrastructure finance. Because infrastructure project income is typically received in local currency, but interest and principal debt repayments are made in foreign currency. Capital regulations and currency swings limit the native currency's convertibility and flexibility, posing significant obstacles for foreign investors and financiers.[78]

Finally, official development assistance (ODA) is regarded as another form of public financing; these aids are typically provided in accordance with the donor state's and organisation's goals. These assistances take the form of long-term, low-interest loans with repayment terms ranging from 30 to 40 years, as well as grants. ODAs are often invested in small and medium-sized projects by the donor institution and the state agency, other than the host state's budget, or they are conditional aids that can be included in the host state's budget.[79]

9.2. Challenges in Private Finance Methods

There are different obstacles and disadvantages in private sector financing as well as public financing challenges in land-locked developing countries. These difficulties may exist structurally or technically.

To begin with, geographical and climatic circumstances have a negative impact on the investment atmosphere in some LLDC infrastructure markets. Many LLDCs in Asia feature rugged terrains, unfavourable climates, unattractive topography, far-flung cities, and low

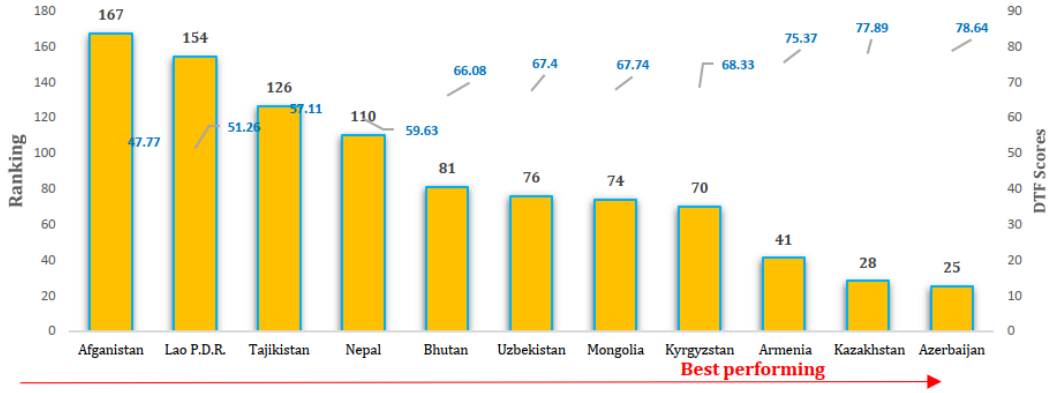
74 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 163.
75 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 12.
76 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 164.
77 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 13–14.
78 Kalu O., "Infrastructure Finance Mechanism and Challenges in Nigeria," 832.
79 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 165; UCLG Committee on Local Finance and Development, *UCLG Support Paper on Local Finance* (2007), 28.

population densities. As a result, infrastructure construction prices rise, and investment prospects become less appealing to international investors.[80] Foreign investors must also comply with statutory requirements such as foreign capital restrictions, inspection and approval procedures, important foreign staff limitations, and other functional requirements in addition to these constraints. However, only state-owned enterprises operate in sectors such as energy, railways, airports, and water distribution. These sectors or sub-sectors are off-limits to both private domestic and foreign direct investment.[81]

Likewise, issue confronting conventional finance is a lack of financial inclusion. That is, many low-income individual investors and enterprises are unable to access financial resources due to a lack of viable financial markets, high financing costs, and the risk inherent in investment. As a result, the investment climate has deteriorated and economic development has stalled [82].

The business conditions in Asian LLDCs vary significantly from one another. According to the World Bank (2019), Afghanistan and Laos have the lowest economic standings among LLDCs, ranking 167th and 154th out of 190 nations, respectively. Their business environments are similarly unfavourable for private investors in infrastructure projects. Azerbaijan, Kazakhstan, and Armenia, which lead the list of Asian LLDCs with abundant natural resources, rank 25th, 28th, and 41st, respectively (Figure 7). By enacting rules and regulations favourable to foreign investment, these three countries insured the liberalisation of their economic policies and boosted the attractiveness of infrastructure investment.[83]

Figure 7. Doing Business Rankings for Asian LLDCs, 2019



Source: United Nations-ESCAP, Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities (Bangkok, 2020), 14.

Another challenge is the uneven rivalry in infrastructure investments between state-owned enterprises and the private sector. The dominance of state-owned firms can lead to market distortions, reducing the possibilities for foreign and private sector engagement. Furthermore, financial and political risks may pose the greatest challenge to financial institutions involved in infrastructure investments. Because infrastructure investments often do not create cash flow for a short period of time, and the first phase of a project is riddled with uncertainty. Similarly, private finance is far more susceptible to country risks than non-infrastructure investments. As a result, political risks such as convention violations and

80 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 169–170.
81 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 14–16.
82 Lone, "Islamic Finance: An Alternative Approach to Financial Inclusion," 159–160.
83 United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 170–171.

regulatory decisions have been identified as the key constraints to emerging-market infrastructure investment. The most serious challenge for Asian LLDCs, however, is a lack of properly developed financial institutions and capital markets capable of producing considerable savings and directing these resources into infrastructure investments. In these countries, the banking industry primarily provides short-term financing, whereas pension funds and insurance companies, which focusing on long-term investments but only provide a small amount of funding due to the lack of a potential capital market (bond and stock market). As a result, long-term infrastructure projects suffer financing gaps.[84]

Lastly, the public-private partnership (PPP) model, which allows private sector engagement in public sector-led infrastructure investments, has lately gained appeal in most Asian LLDCs. However, there are still barriers to the adoption of PPPs, such as a lack of public guidelines on techniques and legalities, a lack of evaluation criteria, unclear public objectives, lengthy approval processes and administrative procedures, weak business strategies, and so on.[85]

10. DEVELOPMENT OF ISLAMIC FINANCE IN ASIAN LLDCs

Asian landlocked developing countries can be divided into two groups in terms of Islamic finance development. The first group of Muslim-majority countries comprises Uzbekistan, Tajikistan, Turkmenistan, Kazakhstan, and Kyrgyzstan in Central Asia, Afghanistan in South Asia, and Azerbaijan in West Asia. The second group of countries with non-Muslim majorities includes Bhutan and Nepal in South Asia, Laos in Southeast Asia, Armenia in West Asia, and Mongolia in East Asia.

Since the fall of the Soviet Union and the emergence of new nation-states in 1991, the Muslim nations of Central Asia have seen the entrance of Islamic banking and finance. The IsDB has been a driving force behind the expanded dissemination of financial projects in the region that adhere to Islamic principles such as no usury or ribâ.[86]

However, according to Geoffrey F. Gresh's (2007) study, the Islamic finance industry in the region was in a quandary. Most crucially, the industry has had to contend with the widespread Soviet heritage that still pervades both politics and the economy. The majority of republics had retained centralised planning and strong control over the banking sector.[87]

According to Refinitiv (2021), Kazakhstan is rated 24 in the world in terms of Islamic Finance development (i.e., above the global average) in 2020, and it leads the Central Asian markets. Kyrgyzstan, Tajikistan, and Uzbekistan are ranked 38, 46, and 49, respectively, in the world. Turkmenistan, on the other hand, falls far behind, garnering only 85 points.[88]

In Azerbaijan, shariah-compliant banking now accounts for a small portion of the Azerbaijani financial system. According to recent projections, Azerbaijan's Islamic financial assets could reach more shortly. Azerbaijan is establishing the legal framework for Islamic financial products such as the issuing of Islamic bonds (Sukuk), and in order to help funding Azerbaijan's SMEs, it will promote Sukuk, Takaful (Islamic insurance), and halal microcredit. Azerbaijan currently has a variety of fully operational Islamic banks that provide retail and Islamic corporate banking by providing halal financial services such as Ijarah, Ijara-wa-iqtina, Mudaraba, Murabaha, and Musharaka.[89]

According to the Islamic Financial Services Board (IFSB), Islamic banking in Afghanistan has nearly tripled in size since 2014, but it is hampered by inconsistent

[84] United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 16–17.
[85] United Nations-ESCAP, *Infrastructure Financing for Sustainable Development in Asia and the Pacific*, 171.
[86] Gresh, "The Rise of Islamic Banking and Finance in Central Asia," 1.
[87] Gresh, "The Rise of Islamic Banking and Finance in Central Asia," 8.
[88] Nagayev - Jahangir, *Islamic Finance in Central Asia and Russia*, 3.
[89] "Azerbaijan Islamic Banking Finance" (2023).

profitability, limited investment alternatives, and a lack of financing tools. The banking system in Afghanistan is limited, but Islamic finance is seen as a feature that could help lure more people to the official economy in a country where just 15% of individuals have a bank account. The country currently has a full-fledged Islamic bank as well as six Islamic windows in conventional banks. According to IFSB data, they had a total of 27.8 billion Afghani ($365.5 million) at the end of the second quarter of 2018. The Islamic Bank of Afghanistan received the country's first Islamic banking license in April 2018, after converting its operations from a conventional banking license. Afghanistan's central bank implemented Islamic banking laws in 2015 and is currently working on further accounting and product development requirements.[90] Furthermore, Afghanistan is working on a sukuk law with accompanying legislative and implementation plans.[91] Pierre Rostan and others' (2021) surveys shows that innovative marketing and awareness campaigns about Islamic banking were more important in attracting clients than religious concepts in Afghanistan.[92]

In addition to the popularity of the Islamic finance sector among Muslim-majority countries, non-Islamic countries have been attracted to the Islamic banking finance industry.[93] For example, according to Dealogic data, the value of Islamic bonds issued in the Middle East and Southeast Asia by non-Muslim countries surpassed $2.25 billion in 11 months in 2017. It was $2 billion in 2016 and $1 billion in 2015.[94]

Although Asian LLDCs such as Armenia, Bhutan, Laos, Mongolia, and Nepal, which have a non-Islamic system and a majority of non-Muslim populations, have not taken any significant action in the field of using Islamic banking, their interest for the Islamic finance industry is remarkable. For instance, the CIMB Group, whose main offering is Islamic banking, launched its presence in Laos PDR on August 29, 2014, with the opening of the CIMB Thai - Vientiane branch. In the most recent case, Laos will host the International Conference on Islamic Banking, Finance, and Commerce ICIBFC on December 13-14, 2023.[95]

11. HOW ISLAMIC FINANCE ADDRESSES THE SHORTCOMING OF CONVENTIONAL FINANCING METHODS?

Social and economic justice are The most significant features of Islamic economics and finance. It also includes a comprehensive system of ethics and moral ideas. Individual interests do not clash with social goals under this system. Alternatively, the financier's interests are closely linked to those in need of funding. Markets can function freely under a competitive price system, openness, and disclosures, as long as prominent and influential segments of society do not distort them. Within this fundamental framework, individuals have the right to ownership and the freedom of entrepreneurship, and they can make a return or profit by contributing value and sharing profits and losses. The government must play an oversight function to allow for a stronger relationship between the real economy and finance to make a contribution to growth and more evenly shared income. Infrastructure projects also receive financing through the Islamic financial system to expand and improve social welfare per the principle of shared income or risk sharing.[96]

According to research conducted by the World Bank Group, PPIAF, and IsDB (2017), Islamic finance's basic principles and asset-backed strategy make it a viable option for infrastructure financing. Risk sharing is required as a basic principle, and the asset-backed

90 Bernardo Vizcaino, *Islamic Finance in Afghanistan Growing, Investment Options Limited* (2018), 1.
91 Asian Development Bank, "Trends in Asia for Sukūk" (2017), 1.
92 Pierre Rostan et al., "Challenges of Islamic Banking in Least Developed Countries: The Case of Afghanistan," *Journal of Emerging Economies and Policy* 6 (2021), 1.
93 The Express Tribune, "Islamic Finance Attracts Non-Muslim Countries" (2017).
94 The Express Tribune, "Islamic Finance Attracts Non-Muslim Countries" (2017).
95 Conference Index, "International Conference on Islamic Banking, Finance and Commerce ICIBFC on December 13-14, 2023 in Vientiane, Laos" (2023).
96 Ayub, *Understanding Islamic Finance*, 12.

technique supports the use of tangible or intangible assets in transactions. Risk sharing allows capital suppliers to participate in core economic activities, hence promoting societal and economic progress. Infrastructure can be tangible or intangible, making it an excellent candidate for funding using Islamic finance methods. Islamic finance encourages collaboration and risk sharing, which emerges as profit and loss sharing. These financing mechanism components aid in the application of Islamic finance to public-private partnerships.[97] Because the public-private partnership projects have features that are consistent with Islamic finance principles. Firstly, public-private partnership projects allow for risk sharing among project participants, including financiers. Secondly, Public-private partnership projects allow Islamic financiers to become project participants rather than just lenders. Thirdly, PPP infrastructure projects are naturally free of speculation and gambling. Lastly, project contracts are often well-specified and free of uncertainties.[98]

One of the fundamental issues of conventional finance approaches is a lack of financial inclusion. Because of the high cost of financing and currency risk, small economic sectors with investment potential are deprived of financial resources. Islamic finance addresses the issue of financial inclusion from two perspectives: one through the promotion of risk-sharing contracts that give a viable alternative to conventional debt-based financing and the other through particular methods of wealth redistribution across society.[99]

Lastly, Islamic financial institutions are more resistant to economic shocks in theory since shariah prohibits gharar (speculation); hence, they do not invest in toxic products with high risk or subprime. The global financial crisis had little direct impact on Islamic financial institutions, which were initially shielded from their losses.[100]

When it comes to the viability and execution of Islamic finance solutions in LLDCs, Islamic finance has emerged as a novel source of infrastructure financing, owing to its growing penetration rate, particularly in the banking sectors of LLDCs in Central Asia and beyond. In some countries, Islamic finance already accounts for more than half of total financial assets.[101] Furthermore, the following factors corroborate our claim:

Firstly, Muslim populations are growing in various Asian countries, particularly in South East Asia. Quick Muslim population growth and rising living standards may boost Islamic finance's popularity as a viable alternative to traditional financing processes. Furthermore, investors from the Middle East and Asia are increasingly looking for products that align with their religious values. According to surveys, half of all Muslims worldwide would choose Islamic finance if provided a credible alternative to conventional services.

Secondly, several Asian governments and financial authorities have taken active roles in promoting the development of Islamic financial markets, in line with efforts to increase investments and achieve long-term funding to boost economic growth by tapping into vast amounts of liquidity from oil and commodity-producing countries.

Thirdly, the ethical nature and financial soundness of Islamic financial products may add to their appeal. Islamic financial products have an ethical focus (particularly, they do not invest in alcohol or gambling) and a risk profile that appeals to a broader group of socially minded investors. As a feasible alternative financial system, Islamic financing has been proposed.

Fourthly, considering that investments in Islamic banking are based on underlying economic activities and/or assets that make up the agreement between transacting parties,

97 World Bank Group et al., *Reference Guide: Islamic Finance for Infrastructure PPP Projects*, 8–9.
98 COMCEC Coordination Office, *Infrastructure Financing through Islamic Finance in the Islamic Countries*, 44.
99 Lone, "Islamic Finance: An Alternative Approach to Financial Inclusion," 159–160.
100 Zouhair Kastite, *Islamic Finance: Complement or Alternative* (2008), 33.
101 United Nations-ESCAP, *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*, 35.

the asset-based nature and risk-sharing features of Islamic finance can be used to improve the overall economic balance between the real and finance sectors.[102]

CONCLUSION

Investment in infrastructure is essential for economic development. The primary challenge of infrastructure investment is locating sufficient and affordable financial resources. Financial resources can be provided in many different kinds of ways. Governments contribute significant financial resources for infrastructure in most developing countries. However, the private sector plays a greater part in infrastructure finance in many developed countries. Nevertheless, the fundamental issue is the challenges related to conventional finance methods.

Asian landlocked developing countries need to undertake significant investments in infrastructure to achieve economic development. However, these countries confront financial constraints due to a lack of access to maritime transportation, difficult environmental circumstances, and an emerging economy. Such economies are highly dependent on neighbours. Domestic markets are insufficient to fund infrastructure, increasing these economies' reliance on external borrowing. However, overseas loans are subject to currency risk. Furthermore, management weakness causes the aforementioned financial resources to be misused, reducing the ability to repay the loans.

In order to expand infrastructure investment, appropriate financing mechanisms must be used until the investment climate improves and financial inclusion takes place. It means that small investors with an investment concept can gain access to financial resources. On the other hand, currency risk, which creates economic slowdown and market uncertainty, must be reduced. However, it appears that conventional financing systems based on interest are not ideal for infrastructure financing. Because, in conventional financing systems, the borrower typically takes the risk, and financial resources are only available to those who pay the highest interest rate. Consequently, minor economic sectors are deprived of financial resources, and financial inclusion does not occur. On the other hand, currency risk raises the cost of borrowing and limits the investment amount.

The Islamic financial system based on risk sharing may be an excellent alternative to conventional finance methods. Because, in the context of this system, risk is distributed between the financier and the investor rather than transmitted from one to the other. It indicates that the financier stands to gain if the investment is successful. In this system, since there is no interest rate, small and medium enterprises also have access to financial resources, and as a result, the amount of investment increases. On the other hand, profit and loss participation reduces currency risk because the financing yield is calculated based on the outcomes of the financed project rather than the fixed interest rate. The capability of public-private partnership contracts under the Islamic financial system eliminates negative competition between private and public enterprises. As a result, integrating government leadership and oversight with the potential employees and expertise of the private sector boosts project efficiency and productivity.

In this article, the challenges of Islamic finance methods are not discussed in detail, and this does not mean ignoring them. The paper particularly investigated infrastructure financing issues in the Asian LLDCs and discussed whether Islamic finance can be an alternative solution for the infrastructure financing needs in the Asian LLDCs. Overall, the findings of this research show that the mechanism of Islamic finance for infrastructure financing in Asian LLDCs is more responsive than conventional financing.

This paper is an initial exploratory study to answer whether Islamic finance can be used as a tool to finance infrastructure projects in the Asian LLDC. The findings of this study are qualitative and limited to qualitative content (previous studies, reports) data. Future studies

[102] Akbar Komijani - Farhad Taghizadeh-Hesary, *An Overview of Islamic Banking and Finance in Asia* (2018), 13.

can focus on and use a quantitative approach to elaborate these initial findings and policy recommendations for each country, considering its idiosyncratic structures.

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REFERENCES

Abdulkareem, Ibraheem Alani - Mahmud, Mohd Sadad. "Infrastructure Project Financing Through Sukuk as an Alternative to Conventional Bond Financing." *Journal of Management and Operation Research* 1/19 (2019), 1–11.

Abdullah, Abdul Aziz et al. "Risk in Funding Infrastructure Projects through Sukuk or Islamic Bonds." *International Review of Management and Business Research* 3/2 (2014), 915–928.

Aktan, Coşkun Can - Dileyici, Dilek. "Genel Olarak Altyapı Hizmetleri." *Altyapı Ekonomisi: Altyapı Hizmetlerinde Serbestleşme ve Özelleştirme*. Ankara: Seçkin Yayınları, 2005.

Arsalan, Ahmet Gökhan. *Altyapı Yatırımlarının Sermaye Piyasası Araçlarıyla Finansmanı ve Kurumsal Yatırımcılarının Rolü*. Gazi Üniversitesi, 2019.

Asian Development Bank. "Trends in Asia for Sukūk." 2017

Ayub, Muhammad. "Focusing Project Financing for Growth and Realising the Higher Objectives of Shar ̄ı'Ah." *Journal of Islamic Business and Management (JIBM)* 09/02 (2019), 235–247. https://doi.org/10.26501/jibm/2019.0902-001

Ayub, Muhammad. *Understanding Islamic Finance*. West Sussex: John Wiley & Sons, 2007. http://books.google.com/books?id=-3eZcL_kAkMC

Bahtiyar, Erhan. *Altyapı Yatırımlarının Mevcut Finansman Modelleri Ile Sukuk Finansman Modelinin Mukayeseli Analizi (Doktora Tezi)*. İstanbul Üniversitesi, 2021.

Bakhor, Sharifah Nurul Azlin bt Syed Mohd. *Sukuk as a Means of Project Financing* (2013).

Baskakova, Irina V. - Malafeev, Nikita S. "The Concept of Infrastructure: Definition, Classification and Methodology for Empirical Evaluation." *Известия Уральского Государственного Экономического Университета* 3/71 (2017), 29–41.

Biancone, Paolo Pietro - Shakhatreh, Mohammad Ziad. "Using Islamic Finance for Infrastructure Projects in Non-Muslim Countries." *European Journal of Islamic Finance* 2/2 (2015), 1–8.

Buhr, Walter. *What Is Infrastructure?* Volkswirtschaftliche Diskussionsbeiträge, Universität Siegen, Fakultät Wirtschaftswissenschaften, Wirtschaftsinformatik und Wirtschaftsrecht, 2003.

Chen, Can - Bartle, John R. *Infrastructure Financing: A Guide for Local Government Managers* (2017).

Chong, Sophia - Poole, Emily. *Financing Infrastructure: A Spectrum of Country Approaches*, 2013.

COMCEC Coordination Office. *Infrastructure Financing through Islamic Finance in the Islamic*

Countries. Ankara, 2019.
Conference Index. "International Conference on Islamic Banking, Finance and Commerce ICIBFC on December 13-14, 2023 in Vientiane, Laos." 2023
Creswell, John W. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Boston, MA: Pearson, 4th Ed., 2012. https://doi.org/10.1017/CBO9781107415324.004
Croce, Raffaele Della et al. *Infrastructure Financing Instruments and Incentives*. Paris, 2015. 69.
Diallo, Amadou Thierno - Gundogdu, Ahmet Suayb. *Islamic Financial Product Development in the Context of Education and Health*, 2021. https://doi.org/10.1007/978-3-030-67094-8_8
Eid, Serge Emile. *Financing Infrastructure Projects*. American University of Beirut, 2008.
Frischmann, Brett M. *Infrastructure: The Social Value of Shared Resources*. Oxford University Press, 2012.
Galih, Waskitha W. - Prijadi, Ruslan. "The Choice of Infrastructure Project Financing Strategies: A Case of A Seaport in Indonesia." *Proceedings of the 12th International Conference on Business and Management Research (ICBMR 2018)*. 116–122. Atlantis Press, 2019. https://doi.org/10.2991/icbmr-18.2019.20
Gresh, Geoffrey F. "The Rise of Islamic Banking and Finance in Central Asia." *Al Nakhlah* Fall (2007).
Halland, Håvard et al. *Resource Financed Infrastructure: A Discussion on a New Form of Infrastructure Financing*. Washington DC: International Bank for Reconstruction and Development / The World Bank, 2014. https://doi.org/http://dx.doi.org/10.1596/978-1-4648-0239-3
ICMA Paris Representative Office. *Green Bond Principles: Voluntary Process Guidelines for Issuing Green Bonds*. Paris, 2021.
Infrastructure Australia. *An Assessment of Australia's Future Infrastructure Needs* (2019). 639.
Irmak, Erdoğan. *Kamu Yatırımları Finansmanı ve Altyapı Yatırımlarının Finansmanında Altyapı Yatırım Ortaklarının Kullanılması ve Değerlendirilmesi (Yüksek Lisans Tezi)*. Gazi Üniversitesi, 2010.
Kalu O., Emenike. "Infrastructure Finance Mechanism and Challenges in Nigeria." *Independent Journal of Management & Production* 6/3 (2015), 827–836.
Kaplan, Fikri. "Using Islamic Finance for Infrastructure Projects in Turkey: A Study of the Potentials, Challenges and Current Situation." *Finansal Piyasaların Evrimi: Bankacılık, Risk Yönetimi, Piyasa*. ed. Buket Altunkeski Kırcı - Mehmet Fatih Buğan. 153–166. Gaziantep: Özgür Yayınları, 2023. https://doi.org/https://doi.org/10.58830/ozgur.pub67 This
Kastite, Zouhair. *Islamic Finance: Complement or Alternative* (2008).
Komijani, Akbar - Taghizadeh-Hesary, Farhad. *An Overview of Islamic Banking and Finance in Asia* (2018).
Lohawiboonkij, Sisira. "The Best Project Financing Option for Infrastructure Projects in Developing Nations." *PM World Journal* VIII/I (2019).
Lone, Naveed Ahmad. "Islamic Finance: An Alternative Approach to Financial Inclusion." *Insight Islamicus* 19/ (2019).
Nagayev, Ruslan - Jahangir, Rashed. *Islamic Finance in Central Asia and Russia*. Istanbul, 2022.
Nakamura, Hideo et al. *Principles of Infrastructure: Case Studies and Best Practices*. Tokyo: Asian Development Bank Institute, 1st Ed., 2019.
Reddy, Namratha. "Economic Infrastructure – Intro, Types, Significance." 2018
Rostan, Pierre et al. "Challenges of Islamic Banking in Least Developed Countries: The Case of Afghanistan." *Journal of Emerging Economies and Policy* 6/ (2021), 5–19.
Sadikot, Rishad. "Islamic Project Finance: Shari'a Compliant Financing of Large Scale Infrastructure Projects." *Al Nakhlah: Online Journal on Southwest Asia and Islamic Civilization* Spring (2012), 1–9.

The Express Tribune. "Islamic Finance Attracts Non-Muslim Countries." 2017

The Public-Private Infrastructure Advisory Facility. *Project Finance: Introductory Manual on Project Finance for Managers of PPP Projects* (2001).

Torrisi, Gianpiero. *Public Infrastructure: Definition, Classification and Measurement Issues*. Munich, Germany, 2009.

Tuna, Mustafa - Bostancı, Sevilay. "Mahalli İdarelerde Altyapı Yatırımlarının Finansman Yöntemleri: Ankara Su ve Kanalizasyon İdaresi (ASKİ) Genel Müdürlüğü Örneği." *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi* 23/4 (2021), 1477–1499.

UCLG Committee on Local Finance and Development. *UCLG Support Paper on Local Finance* (2007).

UN-OHRLLS. *Landlocked Developing Countries Fact Sheet 2020* (2020).

UNCTAD. *Economic Diversification in Selected Asian Landlocked Developing Countries (Bhutan, Kazakhstan, Mongolia, and Turkmenistan): Challenges, Policy Options, and the Way Forward*. Geneva: United Nations, 2020.

United Nations-ESCAP. *Infrastructure Financing for Sustainable Development in Asia and the Pacific*. Bangkok, Sales No., 2019.

United Nations-ESCAP. *Infrastructure Financing in Asian Landlocked Developing Countries: Challenges, Opportunities and Modalities*. Bangkok, 2020.

Vizcaino, Bernardo. *Islamic Finance in Afghanistan Growing, Investment Options Limited* (2018).

Voropaeva, Lyudmila N. - Yurieva, Tatiana V. "Project Finance: Principles and Efficiency." *8th International Scientific Conference on Project Management in the Baltic Countries*. Riga: University of Latvia, 2019.

World Bank. *What Are The Green Bonds?* Washington DC, 2015.

World Bank Group et al. *Reference Guide: Islamic Finance for Infrastructure PPP Projects*. Washington DC, 2019.

"Azerbaijan Islamic Banking Finance." 2023. Accessed August 10, 2023. https://www.shariabanking.com/azerbaijan.html