

## The Readiness of The Measuring Model of Infrastructure Provisioning Under Sharia Public-Private Partnerships Financing Scheme

Sugeng Santoso <sup>1\*</sup>, Indra Siswanti <sup>2</sup>, R. Nur Hidayat <sup>3</sup>, Salmi Mohd. Isa <sup>4</sup>,  
Muhammad Ramadhani Marfatah <sup>5</sup>

<sup>1,2</sup> Department Management, Faculty of Economics and Business, Mercu Buana University, Indonesia

<sup>3</sup> Research Center for Cooperatives, Corporations, and People's Economy, BRIN, Indonesia

<sup>4</sup> Universiti Sains Malaysia, Malaysia

<sup>5</sup> Coordinating Ministry for Maritime and Investment Affairs, Indonesia

---

### ARTICLE INFO

---

**Article history:**

Received May 17, 2022

Revised May 28, 2022

Accepted August 8, 2022

Available online on October 17, 2022

---

**Keywords:**

model, measurement, infrastructure, sharia public-private partnerships

---

**Paper type:** Research paper

---

**Please cite this article** [Turabian of style 8th edition]: Santoso, Sugeng, Indra Siswanti, R Nur Hidayat, Salmi Mohd Isa, and Muhammad Ramadhani Marfatah. "The Readiness of The Measuring Model of Infrastructure Provisioning Under Sharia Public-Private Partnerships Financing Scheme". *IQTISHODUNA: Jurnal Ekonomi Islam* 11, no. 2 (n.d.): 139-154. Accessed October 17, 2022.

---

---

### ABSTRACT

---

Meeting the demands of infrastructure development is reliant on contributions from different parties, including government bodies and businesses. To fulfill this crucial goal, a financing scheme needs to be established, promoting collaboration among these stakeholders. This scheme enables effective contributions from both government and business entities. As the most populous Muslim country in the world, Indonesia is undergoing rapid advancements within the halal value chain, which includes the initiation of infrastructure provisioning through the Sharia-compliant Public-Private Partnerships (PPP) financing scheme. Therefore, this research assessed the Innovation Readiness Level (IRL) and Technology Readiness Level (TRL). Employing a participatory approach through Focus Group Discussions (FGD), stakeholder dialogues were conducted to explore transportation infrastructure financing under the Sharia PPP scheme. The analysis gauged readiness levels using self-assessment for IRL and TRL, subsequently corroborated by respondents to ascertain their preparedness. This research yielded an analytical model to measure infrastructure financing readiness under the Sharia PPP scheme. The results indicated IRL 1, accompanied by a TRL 3. This showed the necessity of refining the readiness assessment model to enhance stakeholder comprehension of associated advantages. Ideally, IRL could be raised beyond 1, and achieving

---

Katsinov 3 alongside TRL levels of 8 or 9 would greatly instill confidence among relevant stakeholders considering the adoption of the Sharia PPP financing scheme.

---

**Abstrak:** Pemenuhan kebutuhan pembangunan infrastruktur membutuhkan kontribusi dari berbagai pihak, termasuk pemerintah dan badan usaha. Untuk memenuhi kebutuhan ini diperlukan skema pembiayaan Kerjasama Pemerintah dan Badan Usaha yang memungkinkan pemerintah dan badan usaha untuk berkontribusi. Indonesia sebagai negara muslim terbesar di dunia mengalami perkembangan pesat dalam rantai nilai halal, termasuk dalam hal inisiasi penyediaan infrastruktur dengan skema pembiayaan KPBU Syariah. Penelitian ini bertujuan untuk menganalisis model kesiapan pembiayaan infrastruktur dengan skema KPBU Syariah dengan menggunakan pendekatan konsep Tingkat Kesiapan Inovasi (Katsinov) atau *Innovation Readines Level* (IRL) dan *Technology Readiness Level* (TRL) atau tingkat kesiapterapan teknologi. Metode yang dilakukan dengan menggunakan pendekatan partisipatori melalui *Focus Group Discussion*, dimana diskusi dilakukan bersama stakeholder pembiayaan infrastruktur transportasi melalui skema pembiayaan KPBU Syariah. Analisis dilakukan untuk menentukan tingkat kesiapan melalui self assessment Katsinov dan TRL dan selanjutnya hasil self assessment TRL dikonfirmasi ke responden untuk menentukan tingkat kesiapannya. Keluaran dari penelitian ini berupa model analisis pengukuran kesiapan pembiayaan infrastruktur melalui skema pembiayaan KPBU Syariah dengan hasilnya adalah Katsinov level 1 dan TRL level 3. Hal ini menunjukkan bahwa model pengukuran kesiapan ini perlu ditingkatkan agar pemangku kepentingan memahami manfaatnya, setidaknya dapat ditingkatkan menjadi Katsinov yang lebih dari 1, dan akan sangat bagus jika Katsinov 3 dan TRL-nya menjadi 8 atau 9 agar pihak terkait merasa aman menggunakan skema pembiayaan KPBU Syariah.

**Kata kunci:** model, pengukuran, infrastruktur, kemitraan publik-swasta syariah

## INTRODUCTION

The global halal value chain is undergoing remarkable development, capturing the attention of nations as a potent avenue for driving economic expansion. The burgeoning trajectory is fundamentally propelled by the escalating demand for halal products<sup>1</sup>, precipitated by multifaceted factors. These catalysts involve the substantial growth of the Muslim populace<sup>2</sup>, the elevated income levels and purchasing prowess within Muslim nations, the surging inclination toward halal acquisitions among non-Muslim consumers<sup>3</sup>, and the steadfast commitment to Sharia principles among Muslim immigrants residing in minority enclaves. The global expenditure of the Muslim populace within the halal industrial sector<sup>4</sup>, involving domains such as halal food<sup>5</sup>,

---

<sup>1</sup> Azam, M.S.E., and Abdullah, M.A. "Global Halal Industry: Realities and Opportunities". *International Journal of Islamic Business Ethics*, 5 (1, 2020), 57 – 59.

<sup>2</sup> Ardiani Aniqoh, Nur Aini Fitriya, and Hanastiana, Metta. "Halal Food Industry: Challenges and Opportunities in Europe" *Journal of Digital Marketing and Halal Industry* [Online], Volume 2 Number 1 (30 April 2020)

<sup>3</sup> Wibowo, M.W., and Ahmad, F.Z. (2016). Non-Muslim Consumers' Halal Food Product Acceptance Model. *Procedia Economics and Finance*, 37, 276 – 283.

<sup>4</sup> Dinar Standard. *State of the Global Islamic Economy Report 2020/2021: Thriving in Uncertainty*: Retrieved from

media, leisure, modest fashion, pharmaceuticals, cosmetics, and Muslim-friendly travel, attained an estimated USD 2.02 billion in 2019. This computation shows a commendable growth rate of approximately 3.2% compared to the preceding year, 2018. Indonesia acclaimed as the nation with the most extensive Muslim population, has earned a notable standing for its contributions to the halal industry<sup>6</sup>. In 2019, this country secured the fourth rank on the Global Islamic Economic Indicator (GIEI) roster, surpassing Malaysia, Saudi Arabia, and the United Arab Emirates (UAE)<sup>7</sup>.

With the burgeoning global demand for halal products, there has emerged an amplified comprehension of the halal concept. This expanded understanding includes the establishment of robust infrastructure to facilitate accelerated growth and economic equity. However, due to financial limitations, the government faces challenges in constructing and managing the necessary infrastructure. Meeting this infrastructure demand necessitates collective efforts from diverse stakeholders, comprising governmental bodies and business entities. In response, an innovative scheme, the Government and Business Entity Cooperation or '*Kerjasama Pemerintah dan Badan Usaha (KPBU)*,' was developed. This scheme facilitates synchronized contributions from both governmental bodies and business entities, aligning with their respective capabilities and specialized proficiencies to support national infrastructure development. Within this collaborative paradigm, the government assumes a multifaceted role involving project preparation, feasibility assessment, financing provisioning, guarantees, and land acquisition. Business entities, on the other hand, shoulder responsibilities including financing, development, management, and maintenance. This synthesis of efforts aligns with Sharia principles, underscoring the importance of transparency and equitable risk distribution in the implementation of PPP Projects. The alignment positions PPP Projects to be potentially implemented in a Sharia-compliant manner. To actualize this alignment holistically, meticulous attention is required in delineating contracts between relevant stakeholders, including the PPP agreement and guarantee arrangements. Furthermore, exploring alternative avenues for Sharia-compliant<sup>89</sup> financing that business entities can harness stands as a necessity.

---

<https://cdn.salaamgateway.com/reports/pdf/862e1c9a9d925c5cd6aaca31b0ea102e21778a9.pdf> (accessed on March 26, 2021).

<sup>5</sup> Shah, N.W.R., Muhammad, A., Mohamad, S., and Jaafar, H.S. *Journal of Applied Environmental and Biological Sciences*, 6(9S), (2016), 53 – 58.

<sup>6</sup> Karia, N., and Assari, M.H.A.H. (2016). Halal Business and Sustainability: Strategies, Resources, and Capabilities of Halal Third-Party Logistics (3PL). *Progress in Industrial Ecology, an International*, 10(2/3). 286 – 299.

<sup>7</sup> Dinar Standard. (2020). *State of the Global Islamic Economy Report 2020/2021: Thriving in Uncertainty*. Retrieved from <https://cdn.salaamgateway.com/reports/pdf/862e1c9a9d925c5cd6aaca31b0ea102e21778a9.pdf> (accessed on March 26, 2021).

<sup>8</sup> Alik, V. A.; Santoso, S.; Nurmaliki, S.; Anisa, N. (2021). *Marketing Strategy Sharia Financial Institutions to Promote Sharia Fintech and Micro and Small Enterprises (MSES)*.

According to the Indonesian Sharia Economic Masterplan 2019-2024, 'Komite Nasional Ekonomi dan Keuangan Syariah' (KNEKS)<sup>10</sup> endeavors to cultivate a comprehensive Sharia economic ecosystem. This ecosystem includes the halal industry, both commercial and social aspects of Sharia finance, as well as complementary infrastructural facets, involving human resource development, information systems, and economic digitalization. KNEKS stands committed to fostering collaboration and synergy among ministries/agencies, regulators, academia, researchers, practitioners, community organizations, and other relevant stakeholders to realize strategic initiatives. Concurrently, the Indonesian Islamic Financial Architecture Masterplan (MAKSI) assumes the mantle of spotlighting Sharia finance as a formidable asset for the progression of Indonesia. The blueprint of MAKSI underscores the potential of this finance to propel national economic advancement, seamlessly aligning with Sharia principles and the overarching goals of the Indonesian government. By integrating Sharia finance into the core fabric of the national strategy, the government sets a strategic pathway to achieve its developmental goals. This integration not only entices foreign investments, particularly from the Gulf Cooperation Council (GCC) countries, seeking reputable Muslim products but also appeals to local and international investors pursuing ethically and socially responsible projects. Furthermore, Sharia finance caters to investors seeking novel avenues to diversify their investment portfolios. The use of this finance also holds the potential to diversify the sources of funds for the government. Several multilateral institutions, including the Islamic Development Bank, the Asian Development Bank, and the World Bank, contribute to the facilitation of Public-Private Partnerships (PPP) within Indonesia.

The main logistics activities including transportation and warehousing, are contingent on robust infrastructure, involving airports, seaports, roads, railroads, as well as information and communication technology (ICT). This research delves into the role of Islamic Economics and Finance in fostering infrastructure development, specifically focusing on the optimization of Sharia-compliant PPP through comprehensive regulations and fatwas. The utilization of PPP emerges as an alternative approach to facilitate infrastructure<sup>11</sup> expansion. With infrastructure projects being inherently strategic, characterized by extended timelines and substantial investments, the government has embarked on a trajectory of innovation to realize various financing

---

Proceedings of the 1st MICOSS Mercu Buana International Conference on Social Sciences, MICOSS 2020, EAI. doi:10.4108/eai.28-9-2020.2307373

<sup>9</sup> Sugeng Santoso, Rahma Septi Anzelina, Luthfi Aulia Safari, Dimas Iskandar, Fery Erwanda (2021). "Pembiayaan Dan Manfaat Financial Technology (Fintech) Syariah Pada 212 Mart, Syi'ar". *Iqtishadi: Journal of Islamic Economics, Finance and Banking*, 5(1), 68-92. DOI: <http://dx.doi.org/10.35448/jiec.v5i1.9889>

<sup>10</sup> KNEKS (2020). Concept Note\_KPBU Syariah\_KNEKS-PT PII.

<sup>11</sup> Nuh, dan Santoso, S. (2020). An Uplifted over Logistics Costs Efficiency by the Hub and Spoke System at Cikarang Dry Port, *International Journal of Innovative Science and Research Technology*, 5 (7), 123-132. <https://doi.org/10.38124/IJISRT20JUL084>.

mechanisms, particularly through the prism of the PPP framework. This framework offers an avenue for addressing the limitations of government funding. The subsequent discourse delves into the foundational principles underpinning the selection of PPP for the facilitation of infrastructure provisioning.

Types of Sharia Loan Contracts<sup>12</sup>:

1. 'Murabaha' contract
2. 'Wa Iqtina Ijarah' Contract
3. Parallel 'Istishna' Contracts
4. 'Ar Rahn' contract
5. 'Musyarakah Mutanaqishah' Contract
6. 'Musharaka' contract
7. 'Ijarah Muntahiya Bi Tamlik' Agreement (IMBT).
8. 'Mudharabah' contract

Infrastructure requirements during the 2020 to 2024 period exhibited an increase in investment value compared to the 2015 to 2019 era<sup>13</sup>. This surge aligns seamlessly with the overarching governmental strategy to expedite infrastructure development, thereby providing crucial impetus to economic growth and equity. The strategic goal of infrastructure development includes bolstering national connectivity, achieving developmental equilibrium, expediting the provisioning of fundamental amenities (such as housing, clean water, sanitation, and electricity), as well as fortifying water, food, and energy security. This collective initiative aspires to bolster national resilience while developing urban mass transportation systems, all orchestrated within an integrated framework. The key tenet involves the amplification of cooperation between government bodies and business entities. However, the impediment of limited government funds, as delineated within the State Revenue and Expenditure Budget or APBN and Regional Revenue and Expenditure Budget or APBD, presents the challenges encountered in procuring fundamental infrastructure. Therefore, the government is compelled to seek innovative solutions to fulfill its commitment to provide requisite facilities and infrastructure.

The introduction of the PPP scheme can catalyze infrastructure development, integrating seamlessly with Sharia principles. This distinctive approach necessitates contracts that adhere to Sharia tenets, governing the interaction between governmental bodies and business entities, as well as the acquisition of financing. Business entities can source funds from Islamic banks or institutions specializing in Islamic financing, as well as through the issuance of Islamic capital market securities. Investments oriented towards PPP projects, which serve as foundational assets, hold strong appeal for investors. These projects are supported by meticulous groundwork and government-backed

---

<sup>12</sup> KNEKS. (2020). Concept Note\_KPBU Syariah\_KNEKS-PT PII

<sup>13</sup> 'Rencana Pembangunan Jangka Menengah Nasional 2020-2024, Peraturan Presiden Republik Indonesia Nomor 18 Tahun 2020'

assurances, serving to mitigate potential risks. This concerted effort not only fosters the expansion of the Islamic financial market but also enhances the role of the Islamic finance sector in funding governmental initiatives. The pivotal point remains that the implementation of PPP Projects, centered around transparency and equitable risk distribution, harmonizes seamlessly with Sharia principles. Therefore, each implemented PPP Project is poised to be executed based on the Sharia tenets. Regarding the PPP Book 2019 of Bappenas, a plethora of potential PPP projects, collectively amounting to IDR 67.8 trillion, can be effectively realized through the Sharia PPP scheme.

Currently, a notable example of a Sharia PPP is the Regional General Hospital Development Program at Dr. Zainoel Abidin, Aceh, and this initiative stands as the pioneer of Indonesia in the realm of PPP. Encouraged and anchored by the regulatory framework of the Provincial Government of the Special Region of Aceh ('Qanun'), the program is uniquely informed by the stipulation that all economic activities conducted within the region must strictly adhere to Sharia principles. The execution of the PPP Program is underpinned by a steadfast commitment to these principles, involving the incorporation of Islamic legal tenets into agreements ('Akad'), guided by the principles of Muamalah. The main criteria governing a Sharia transaction include:

1. Avoidance of transactions prohibited by Islamic law.
2. The regulations governing this contract or transaction have been codified in the fatwa issued by the MUI National Sharia Council and related statutes.
3. Grounded in Islamic ethics within the realm of Muamalah.

Transactions between the custodians of the Cooperation Project Responsible Holder ('Penanggung Jawab Proyek Kerja Sama = PJPK') and the Implementing Business Entity ('Badan Usaha Pelaksana = BUP'), such as the acquisition of financing for Sharia PPP implementation by the BUP, are meticulously governed by contracts and schemes established within various National Sharia Council Fatwas (DSN). Within the framework of PPP, it is imperative that the financing secured by BUP aligns with both Sharia principles and prudent banking practices. This context allows BUP to have the option to source financing from Sharia-compliant banking institutions, the Sharia non-bank financial sector, or the Sharia capital market. Within this scheme, business entities engaged in Sharia PPP are eligible to access funding from both Sharia-compliant banks and the Sharia capital market. Islamic banking can extend financing independently or through syndicated approaches, employing contracts such as *istishna* or other agreements that have garnered approval from the DSN.

### **Research Objectives**

The objective of this research is to establish a model for measuring the readiness of infrastructure provisioning under a Sharia PPP financing scheme, using the IRL and TRL concept approach.

## Planned Outcome Targets and Research Contribution

This research aims to formulate a model that accurately measures the readiness of infrastructure provisioning under a Sharia PPP financing scheme using the IRL ('Katsinov') & TRL concept approach. The planned outcome is the Infrastructure Provision Readiness Measurement Model for Sharia PPP, as categorized by TRL = 3 and IRL = 1. Therefore, this research falls within the realm of TRL Social and Humanities based on relevant regulations<sup>14,15</sup>.

## METHODS

This research used qualitative and quantitative approaches through a Mixed Methods Research framework. Using the explanatory sequential design, the process entailed an initial phase of quantitative data, followed by its confirmatory analysis.<sup>16</sup> As explained in the previous section, the assessment of the readiness of infrastructure service providers<sup>17</sup> in Indonesia for implementing a halal value chain was conducted<sup>18</sup> using the IRL & TRL benchmarks, in conjunction with the Sharia PPP scheme<sup>19</sup>. To gauge the readiness toward halal infrastructure, a combined quantitative and qualitative investigation was carried out,<sup>20</sup> utilizing the readiness of the Sharia PPP as the foundational framework.<sup>21</sup> This research adopted a qualitative participatory approach, fostering active engagement among community members who constitute the targeted group.

Utilizing a qualitative method, the policy process served as a means to elucidate the relationship between scientific reviews and actionable policies. Policymaking, being a multi-faceted endeavor, necessitated the involvement of knowledgeable stakeholders. Numerous investigations delineated policy

---

<sup>14</sup> Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 29 of 2019 concerning Measurement and Determination of Innovation Readiness Levels.

<sup>15</sup> Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 42 of 2016 concerning Measurement and Determination of the Level of Technology Readiness

<sup>16</sup> Saidah, F., and Lestari, Y.D. (2021). Halal Logistics Practices: Logistics Service Provider Case in Indonesia. *International Journal of Nusantara Islam*, 9(1), 1 - 17.

<sup>17</sup> Santoso, S.; Nurhidayat, R.; Mahmud, G.; Arijuddin, A.M. Measuring the Total Logistics Costs at the Macro Level: A Study of Indonesia. *Logistics* 2021, 5, 68. <https://doi.org/10.3390/logistics5040068>

<sup>18</sup> Zulfakar, M.H., Anuar, M.M., and Ab Talib, M.S. (2014). Conceptual Framework on Halal Food Supply Chain Integrity Enhancement. *Procedia - Social and Behavioral*.

<sup>19</sup> Sazali, A.M., and Ligte, J.S. (2019). The Importance of Halal Logistics Implementation in Indonesia in Compliance with Domestic and Global Halal Market Requirements. *Jurnal Transportasi Multimoda*, 17(2), 17 - 26.

<sup>20</sup> Masudin, I., Fernanda, F.W., Widayat. (2018). Halal Logistics Performance and Customer Loyalty: From the Literature Review to a Conceptual Framework. *International Journal of Technology*, 5, 1072 - 1084.

<sup>21</sup> Karia, N. (2019). Halal Logistics: Practices, Integration and Performance of Logistics Service Providers. *Journal of Islamic Marketing*,

decision-making<sup>22</sup> as a collective effort, undertaken by a group of decision-makers convened in a specific time and place to deliberate upon an issue (or opportunity)<sup>23</sup>. This deliberation entailed an evaluation of various alternative courses of action, meticulously weighing their explicit pros and cons, and their alignment with overarching objectives and priorities. Subsequently, the most suitable course of action, deemed optimal for achieving the goals, was selected. Within this context, a qualitative approach leveraging key informants proficient in policymaking was employed. This approach entailed a sequence of discussions, meetings, and FGD, coupled with a comprehensive review of relevant literature sourced from repositories such as books, encyclopedias, and documents. To explore avenues for the implementation of Sharia PPP, multiple discussions were orchestrated, involving resource persons of significance, including representatives from The Ministry of Public Works and Housing, The Coordinating Ministry for Maritime and Investments Affairs, The Ministry of National Development Planning/National Development Planning Agency, and The National Committee for Sharia Economics and Finance.

The quantitative approach involved descriptive analysis, a statistical method used to analyze data by presenting a description of the collected data without drawing generalized conclusions. Descriptive statistics aimed to provide insight into a specific situation based on actual observations, thereby indicating the responses of respondents. Data collection, an integral facet of the data submission phase, pertained to the sourcing and methods employed for procuring research data. In assembling and enriching this analysis, it became imperative to gather theoretical data and pertinent, lucid, and corroborative information to comprehend the real issue at hand. For data accumulation, direct research interaction with the subject of the investigation was carried out, ensuring the acquisition of the necessary data through the administration of a questionnaire. This data collection technique involved presenting respondents with a set of questions or written statements, prompting respondents to respond. The quantitative approach adopted in this research focused on evaluating the readiness of infrastructure service providers in Indonesia for implementing halal infrastructure services<sup>24</sup>. The approach involved the self-assessment of the Innovation Readiness Level (IRL) and Technology Readiness Level (TRL) instruments.<sup>25</sup> These instruments were administered to a diverse

---

<sup>22</sup> Lestari, Y.D., and Saidah, F.D. (2020). Halal Logistics Policy Development in Indonesia. In N.A.A. Rahman, A. Hasan, and M.F. Mohammad, Halal Logistics and Supply Chain Management in Southeast Asia (pp. 74 – 86). London: Taylor and Francis Group.

<sup>23</sup> Osman, L.H., and Aziz, R.S. (2019). Millennial Generations' Awareness of Halal Supply Chain and Related Food Product in Malaysia. *Management Analysis Journal*, 8(2), 167 – 176.

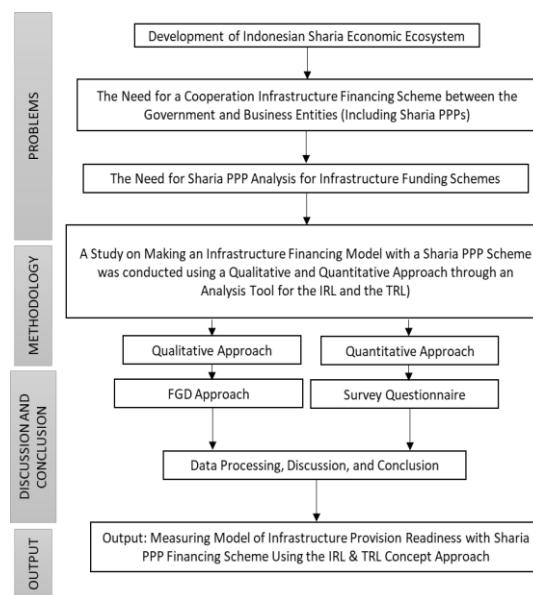
<sup>24</sup> Lestari, Y.D., Susanto, J.M., Simatupang, T.M., and Yudoko, G. (2018). Intention towards halal logistic: A case study from consumers in Indonesia. *Journal for Global Business Advancement*, 11(1), 22 – 40.

<sup>25</sup> Lovika, A., Burhanuddin, B., Santoso, S., & Praktikno, I. (2022). Peran Literasi Keuangan Syariah Pada Pelaku Usaha Makanan Minuman Halal Terhadap Peningkatan Nilai



set of 50 respondents involving various domains of expertise, such as Infrastructure, Islamic Finance, Financial Management, Operations Management, Marketing Management, and Human Resource Management.

This research identified the hurdles and complexities Indonesia encountered in enhancing the readiness of halal infrastructure service providers. The evaluation of the readiness of executing the Sharia PPP was carried out through the IRL. This evaluation took into consideration regulations, rules, guidelines, directives, and developmental objectives, alongside promotional endeavors and strategies that shaped both individual and collective decision-making processes. The research framework was visually shown in Figure 1:



**Figure 1. Research Framework**

The research population comprised the number of executed Sharia PPP projects, and respondents were selected using a purposive sampling technique. As outlined by Sugiyono, this technique involved making selections based on specific criteria. The criteria used for purposive sampling involved individuals who possess a background in IRL (Katsinov) and TRL<sup>26</sup> within sectors related to infrastructure, financial management (including Islamic finance),<sup>27</sup> operational management, human resource management, and marketing management.

Tambah. Jurnal Pendidikan Dan Kewirausahaan, 10(2), 655-667. <https://doi.org/10.47668/pkwu.v10i2.474>

<sup>26</sup> Ade, Agung Fachrully; Santoso, Sugeng; Nando Dwi Yulio (2021). Analysis of The Level Of Innovation And Technology Readiness In The Pond Waterwheel Technology Development Project To Support Increased National Shrimp Production (Case Study Of Pt. Barata Indonesia Persero), Prosiding Seminar Nasional Sains dan Teknologi IV, ISBN 2477-4845 artikel 9, pp. 73 - 81, 2021. <https://prosaintek.ub.ac.id/index.php/prosaintek/4/paper/view/150>

<sup>27</sup> Andrian, D.; Santoso, S. (2020). Build Operate Transfer (BOT) As a Business Role Model for Metering System and Development Projects (Studi Kasus On Metering System Project

## RESULT AND DISCUSSION

KNEKS conveyed several significant points regarding Sharia PPP as, in a general sense, there were no infrastructure projects that violate Sharia principles, thereby enabling the implementation of the PPP scheme. However, disparities between conventional PPP and Sharia PPP revolved around 3 key aspects including, (i) Cooperation Agreement ('Perjanjian Kerja Sama or PKS') between PJPk and BUP. The description of this agreement was characterized as flexible. Although current PKS arrangements generally adhere to Sharia principles, further validation from the DSN MUI was essential due to the absence of an explicit contract within the PKS. (ii) Guarantee Agreement Scheme and Regress Agreement. The description of these elements was deemed important and served as a distinguishing factor between conventional PPP and Sharia PPP in the medium term. (iii) Financing or Funding Scheme. This aspect was considered emergent and held critical importance in discerning conventional PPP from Sharia PPP.

The discussion focused on evaluating the Level of Readiness of the Model for Measuring the Readiness of Infrastructure Provision through the Sharia PPP Financing Scheme, using the Katsinov and TRL<sup>2829303132</sup> Self-Assessment Conceptual Approaches. According to the Regulation of the Minister of Research, Technology and Higher Education of Indonesia Number 29 of 2019 concerning Measurement and Determination of Innovation Readiness Levels, the purpose of Katsinov included gauging the state of readiness or position within the Innovation life cycle and mitigating its risk of failure.

The results of the self-assessment of Katsinov showed that the Readiness of Providing Infrastructure with the Sharia PPP Financing Scheme was positioned at level 1 (Katsinov 1). Risk management factors need to be

---

Which Located At PT. Rexaudia Sasada Sentosa), *Dinasti International Journal of Management Sciences (DIJMS)*, 2(1), 60-69. DOI: 10.31933/dijms.v2i1.525

<sup>28</sup> Santoso, S. Soehari, T. D., Aprianto, Y., Andrean, D., & Henny. (2020). Value Creation In Fisheries Supply Chain As A Role Model For Fish Protein Hydrolyzate Cluster Development. *Jurnal Rekayasa Mesin*, 11(3), 401 – 407. doi:10.21776/ub.jrm.2020.011.03.12.

<sup>29</sup> Santoso, S.; Nusraningrum, D.; Hadibrata, B.; Widyanty, W.; Isa, S. M.; Apriyanto, Y.; Henny. (2021). Policy Recommendation for Food Security in Indonesia: Fish and Sea Cucumber Protein Hydrolysates Innovation Based. *European Journal of Business and Management*, 13(7), 71-79. doi:10.7176/EJBM/13-7-08

<sup>30</sup> Santoso, S., Hapsari, P. A., Difoasih, G., & Prianto, S. E. (2021). Analysis of Public Interest In Online Tourism In The Middle of The Covid-19 Pandemic. *JELAJAH: Journal of Tourism and Hospitality*, 3(1), 1 - 11. <https://doi.org/10.33830/jelajah.v3i1.1745>

<sup>31</sup> Suhendri, D. Pawennei, I. Camil, R. Sudrajat, D. Wahyuni, N. Modul: Memahami Tingkat Kesiapterapan Teknologi, RISETPro-Research & Innovation In Science & Technology Project

<sup>32</sup> Putra, I.M.Y.;Santoso,S.(2020). Rekomendasi Mesin Pengupas Kulit Testa Kelapa Berdasarkan Tingkat Kesiapterapan Teknologi, *Jurnal AGROHITA: Jurnal Agroteknologi*, 5(2), 143-154. DOI : 10.31604/jap.v5i2.2143

improved through partnerships to bolster risk assurance. The relative novelty of Sharia PPP contributed to the lack of a well-defined concept, which, in turn, presented its own set of developmental challenges. Scrutinizing the results derived from the calculation of Katsinov, Sharia PPP were analyzed through the lens of TRL in the Social Humanities<sup>33</sup> category. According to regulatory standards, this level signified a systematic measurement of maturity or readiness condition, rendering it amenable for adoption by stakeholders, including the government, industry, and society.

The self-assessment process was conducted using IRL and TRL, with a total of 50 respondents. Observations from TRL indicated a self-assessment score of 86.7 for TRL 3, thereby meeting the research criteria (with a minimum threshold of 80). Regarding the financing aspect under the Sharia PPP scheme for specific projects, certain questions were raised, including has the design methodology has been formulated based on the Sharia PPP scheme? Respondents might display hesitancy or uncertainty due to inadequate socialization even when the methodology design has indeed been prepared. Another question involved, has a technical evaluation and prediction of implementation results been conducted within the context of financing under the Sharia PPP scheme for specific projects? A deficiency in information and socialization could lead respondents to express uncertainty, despite the preparation of the methodology design.

The analysis conducted to determine the level of readiness through the self-assessment of Katsinov and TRL<sup>34,35,36</sup> showed conclusive results, which were subsequently validated by the respondents to finalize the determination of readiness levels. A purposive sampling technique was employed, as outlined by Sugiyono, which involved deliberate selection based on specific considerations (Sugiyono, 2012). The criteria for this approach included individuals who possess knowledge of Katsinov and TRL<sup>37,38,39</sup> within domains such as

---

<sup>33</sup> Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 42 of 2016 concerning Measurement and Determination of the Level of Technology Readiness

<sup>34</sup> Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 42 of 2016 concerning Measurement and Determination of the Level of Technology Readiness

<sup>35</sup> Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 29 of 2019 concerning Measurement and Determination of Innovation Readiness Levels.

<sup>36</sup> RISTEKDIKTI (2018). Buku Petunjuk Katsinov Meter-Tingkat Kesiapan Inovasi. Lampiran 2, Nomor Surat: 112/F.F2/IN/2018, Tanggal Surat : 06 September 2018

<sup>37</sup> Andrian, D.; Santoso, S. (2020). Build Operate Transfer (BOT) As a Business Role Model for Metering System and Development Projects (Studi Kasus On Metering System Project Which Located At PT. Rexaudia Sasada Sentosa), *Dinasti International Journal of Management Sciences (DIJMS)*, 2(1), 60-69. DOI: 10.31933/dijms.v2i1.525

<sup>38</sup> Ade, Agung Fachrully; Santoso, Sugeng; Nando Dwi Yulio (2021). Analysis of The Level Of Innovation And Technology Readiness In The Pond Waterwheel Technology Development Project To Support Increased National Shrimp Production (Case Study Of Pt. Barata Indonesia Persero), *Prosiding Seminar Nasional Sains dan Teknologi IV*, ISBN 2477-4845

infrastructure, financial management (involving Islamic finance), operational management, HR management, and marketing management. The total respondent count reached 50 individuals, and the questionnaire distribution mechanism was conducted through an online platform, particularly through bitly.

## CONCLUSION

In conclusion, the current implementation of Sharia KBPU remained relatively limited, prompting an investigation into the Measurement Model of Infrastructure Readiness for Sharia Service Providers in Practice within Indonesia. This comprehensive research was conducted using both qualitative<sup>40</sup> and quantitative approaches. Through an analysis of focus group discussions (FGD) and meetings, it was evident that the infrastructure financing scheme employing PPP and its corresponding guarantees has been effectively deployed. Similarly, the infrastructure financing scheme involving the Sharia PPP has been applied for certain projects.

The Measurement Model of Infrastructure Readiness has been meticulously developed through the Sharia PPP Financing Scheme, using the IRL and TRL Concept Approach, yielding the following results:

The readiness level for infrastructure financing aligned with the Sharia PPP scheme, assessed through Katsinov at level 1 and TRL at level 3, has been successfully met.

1. Katsinov level 1 showed the necessity for an enhancement in risk management factors, advocating for the integration of technology and partnerships with various established entities to mitigate the escalation of risks. Considering the novelty of the Sharia PPP framework, a clear concept was yet to be fully established, introducing unique developmental challenges. To address this, dedicated investment in research and development became imperative, ensuring the precise alignment of Sharia PPP implementation with its core objectives, including the provision of Sharia-compliant infrastructure financing in Indonesia.
2. A survey of respondents using a purposive sampling technique showed that 60% of the respondents affirmed the infrastructure financing scheme under the Sharia PPP framework had attained TRL level 3. This indicated the significance of fulfilling requirements, ensuring adequacy and comprehensiveness within the Sharia PPP scheme to bolster infrastructure financing readiness through Sharia-compliant means.

---

artikel 9, pp. 73 - 81, 2021.  
<https://prosaintek.ub.ac.id/index.php/prosaintek/4/paper/view/150>

<sup>39</sup> RISTEKDIKTI (2018). Buku Petunjuk Katsinov Meter-Tingkat Kesiapan Inovasi. Lampiran 2, Nomor Surat: 112/F.F2/IN/2018, Tanggal Surat : 06 September 2018

<sup>40</sup> Denzin, Norman K. dan Yvonna S. Lincoln (eds.). 2009. Handbook of Qualitative Research. Terj. Dariyatno dkk. Jogjakarta: Pustaka Pelajar.

## SUGGESTION

The suggestions or recommendations to foster enhancements within the Sharia PPP scheme include the following.

1. To bolster the implementation of the Sharia PPP scheme, an ongoing collection of pertinent data is essential. This data serves as the bedrock for the development of the Sharia PPP
2. For the readiness of infrastructure financing predicated on the Sharia PPP scheme, a more extensive outreach effort is required. This includes substantial socialization and intermediation endeavors to enhance the understanding of stakeholders regarding Sharia PPP. Failure to do so could lead to stakeholder uncertainty, hesitancy, or lack of confidence in embracing Sharia PPP and their associated benefits.
3. Stakeholder synergy is required for the readiness of infrastructure financing through the Sharia PPP scheme.
4. The current readiness measurement model (Katsinov level 1 and TRL level 3) requires further refinement. This refinement aims to elevate stakeholder awareness and understanding of the benefits, potentially raising it to Katsinov level 3 and TRL level 8. Such enhancements instill a greater sense of security among users, bolstering their confidence in adopting the Sharia PPP scheme.

## REFERENCES

- Ade, Agung Fachrully; Santoso, Sugeng; Nando Dwi Yulio. Analysis of The Level Of Innovation And Technology Readiness In The Pond Waterwheel Technology Development Project To Support Increased National Shrimp Production (Case Study Of Pt. Barata Indonesia Persero), Prosiding Seminar Nasional Sains dan Teknologi IV, ISBN 2477-4845 artikel 9, pp. 73 - 81, 2021.  
<https://prosaintek.ub.ac.id/index.php/prosaintek/4/paper/view/150>
- Alika, V. A.; Santoso, S.; Nurmaliki, S.; Anisa, N. Marketing Strategy Sharia Financial Institutions to Promote Sharia Fintech and Micro and Small Enterprises (MSES). Proceedings of the 1st MICOSS Mercu Buana International Conference on Social Sciences, MICOSS 2020, EAI. 2021 doi:10.4108/eai.28-9-2020.2307373
- Andrean, D.; Santoso, S. Build Operate Transfer (BOT) As a Business Role Model for Metering System and Development Projects (Studi Cases On Metering System Project Which Located At PT. Rexaudia Sasada Sentosa), *Dinasti International Journal of Management Sciences (DIJMS)*, 2(1, 2020), 60-69. DOI: 10.31933/dijms.v2i1.525
- Aniqoh, N.A.F.A., and Hanastiana, M.R. Halal Food Industry: Challenges and Opportunities in Europe. *Journal of Digital Marketing and Halal Industry*, 2(1, 2020), 43 - 54.

- Azam, M.S.E., and Abdullah, M.A. Global Halal Industry: Realities and Opportunities. *International Journal of Islamic Business Ethics*, 5(1, 2020), 57 – 59.
- Denzin, Norman K. dan Yvonna S. Lincoln (eds.). *Handbook of Qualitative Research*. Terj. Dariyatno dkk. Jogjakarta: Pustaka Pelajar, 2009.
- Dinar Standard. State of the Global Islamic Economy Report 2020/2021: Thriving in Uncertainty. 2020. Retrieved from <https://cdn.salaamgateway.com/reports/pdf/862e1c9a9d925c5cd6aaca31b0ea102e21778a9.pdf> (accessed on March 26, 2021).
- Karia, N. Halal Logistics: Practices, Integration and Performance of Logistics Service Providers. *Journal of Islamic Marketing*, (2019).
- Karia, N., and Assari, M.H.A.H.=. Halal Business and Sustainability: Strategies, Resources, and Capabilities of Halal Third-Party Logistics (3PL). *Progress in Industrial Ecology, an International*, 10(2/3, 2016). 286 – 299.
- KNEKS. Concept Note\_KPBU Syariah\_KNEKS-PT PII. 2020.
- Lestari, Y.D., and Saidah, F.D.. Halal Logistics Policy Development in Indonesia. In N.A.A. Rahman, A. Hasan, and M.F. Mohammad, *Halal Logistics and Supply Chain Management in Southeast Asia* (2020, pp. 74 – 86). London: Taylor and Francis Group.
- Lestari, Y.D., Susanto, J.M., Simatupang, T.M., and Yudoko, G.. Intention towards halal logistic: A case study from consumers in Indonesia. *Journal for Global Business Advancement*, 11 (1, 2018), 22 – 40.
- Lovika, A., Burhanuddin, B., Santoso, S., & Praktikno, I. Peran Literasi Keuangan Syariah Pada Pelaku Usaha Makanan Minuman Halal Terhadap Peningkatan Nilai Tambah. *Jurnal Pendidikan Dan Kewirausahaan*, 10(2, 2022), 655-667. <https://doi.org/10.47668/pkwu.v10i2.474>
- Masudin, I., Fernanda, F.W., Widayat. Halal Logistics Performance and Customer Loyalty: From the Literature Review to a Conceptual Framework. *International Journal of Technology* (5, 2018), 1072 – 1084.
- Nadzmi, M.N., and Iskandar, M.L. Factors Influencing Adoption of Halal Logistics among Warehouse Operators. *Journal of Halal Studies*,1(1, 2020), 42 – 55.
- Nuh, dan Santoso, S. An Uplifted over Logistics Costs Efficiency by the Hub and Spoke System at Cikarang Dry Port, *International Journal of Innovative Science and Research Technology*, 5 (7, 2020), 123-132. <https://doi.org/10.38124/IJISRT20JUL084>.
- Osman, L.H., and Aziz, R.S. Millennial Generations' Awareness of Halal Supply Chain and Related Food Product in Malaysia. *Management Analysis Journal*, 8(2, 2019), 167 – 176.
- Putra, I.M.Y.;Santoso,S. Rekomendasi Mesin Pengupas Kulit Testa Kelapa Berdasarkan Tingkat Kesiapterapan Teknologi, *Jurnal AGROHITA: Jurnal Agroteknologi*, 5(2, 2020), 143-154. DOI : 10.31604/jap.v5i2.2143
- Regulation of the Minister of Research, Technology and Higher Education of

- the Republic of Indonesia Number 42 of 2016 concerning Measurement and Determination of the Level of Technology Readiness.
- Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 29 of 2019 concerning Measurement and Determination of Innovation Readiness Levels.
- Rencana Pembangunan Jangka Menengah Nasional 2020-2024, Peraturan Presiden Republik Indonesia Nomor 18 Tahun 2020.
- RISTEKDIKTI. Buku Petunjuk Katsinov Meter-Tingkat Kesiapan Inovasi. Lampiran 2, Nomor Surat: 112/F.F2/IN/2018, Tanggal Surat : 06 September 2018.
- Saidah, F., and Lestari, Y.D. Halal Logistics Practices: Logistics Service Provider Case in Indonesia. *International Journal of Nusantara Islam*, 9(1, 2021), 1 - 17.
- Sazali, A.M., and Ligte, J.S. The Importance of Halal Logistics Implementation in Indonesia in Compliance with Domestic and Global Halal Market Requirements. *Jurnal Transportasi Multimoda*, 17(2, 2019), 17 - 26.
- Shah, N.W.R., Muhammad, A., Mohamad, S., and Jaafar, H.S. *Journal of Applied Environmental and Biological Sciences*, 6(9S, 2016), 53 - 58.
- Santoso, Sugeng, Fatmawati, Ari, Ubaidillah, Rian, Widyanty, Winda, AND Isa, Salmi. "Analysis of Muslim Friendly Tourism Development in Indonesia" *IQTISHODUNA: Jurnal Ekonomi Islam [Online]*, Volume 10 Number 2 (1 October 2021), 17-32
- Santoso, S. Soehari, T. D., Aprianto, Y., Andrean, D., & Henny. Value Creation In Fisheries Supply Chain As A Role Model For Fish Protein Hydrolyzate Cluster Development. *Jurnal Rekayasa Mesin*, 11(3, 2020), 401 - 407. doi:10.21776/ub.jrm.2020.011.03.12.
- Santoso, S.; Nusraningrum, D.; Hadibrata, B.; Widyanty, W.; Isa, S. M.; Apriyanto, Y.; Henny. Policy Recommendation for Food Security in Indonesia: Fish and Sea Cucumber Protein Hydrolysates Innovation Based. *European Journal of Business and Management*, 13 (7, 2021), 71-79. doi:10.7176/EJBM/13-7-08
- Santoso, S.; Nurhidayat, R.; Mahmud, G.; Arijuddin, A.M. Measuring the Total Logistics Costs at the Macro Level: A Study of Indonesia. *Logistics* 2021, 5, 68. <https://doi.org/10.3390/logistics5040068>
- Santoso, S.; Natanael, A.; Fatmawati, A.A.; Griselda, A.; Khoirunnisa, J.; Simanjuntak, M.; Bagus, A. A. R. Analisis Pengembangan Platform Ekspor Sub Sektor Kuliner Tinjauan Dari Model Sistem Inovasi, *Jurnal Distribusi*, 9(1, 2021), 29-38. DOI: 10.29303/distribusi.v9i1.151
- Santoso, S., Hapsari, P. A., Difoasih, G., & Prianto, S. E. Analysis of Public Interest In Online Tourism In The Middle of The Covid-19 Pandemic. *JELAJAH: Journal of Tourism and Hospitality*, 3(1, 2021), 1 - 11. <https://doi.org/10.33830/jelajah.v3i1.1745>
- Sugeng Santoso, Ratih Minanda, Rizki Swastantomo, Kusnadi Kusnadi, Linda

- Syarifah. Hubungan Karakteristik Pekerjaan, Kompensasi, dan Kepemimpinan Transformasional, terhadap Kinerja Operasional, SKETSA BISNIS-Jurnal Administrasi Bisnis, Vol 9 No 1 (2022), 34-52,
- Sugeng Santoso, Rahma Septi Anzelina, Luthfi Aulia Safari, Dimas Iskandar, Fery Erwanda. Pembiayaan Dan Manfaat Financial Technology (Fintech) Syariah Pada 212 Mart, Syi'ar Iqtishadi: Journal of Islamic Economics, Finance and Banking, 5(1, 2021), 68-92. DOI: <http://dx.doi.org/10.35448/jiec.v5i1.9889>
- Suhendri, D. Pawennei, I. Camil, R. Sudrajat, D. Wahyuni, N. Modul: Memahami Tingkat Kesiapterapan Teknologi, RISETPro-Research & Innovation In Science & Technology Project.
- Wibowo, M.W., and Ahmad, F.Z. Non-Muslim Consumers' Halal Food Product Acceptance Model. *Procedia Economics and Finance*, 37(2016), 276 - 283.
- Zulfakar, M.H., Anuar, M.M., and Ab Talib, M.S. Conceptual Framework on Halal Food Supply Chain Integrity Enhancement. *Procedia - Social and Behavioral*, 2014.