

Measuring Model of Infrastructure Provision Readiness with Sharia PPP Financing Scheme Using the IRL and TRL Concept Approach

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ABSTRACT

Meeting the needs of infrastructure development requires contributions from various parties, including the government and business entities. To meet this need, a Government and Business Entity Cooperation financing scheme is needed that allows the government and business entities to contribute. Indonesia as the largest Muslim country in the world is experiencing rapid development in the halal value chain, including the initiation of infrastructure provision with the Sharia PPP financing scheme. Innovation Readiness Level (IRL/'Tingkat Kesiapan Inovasi = Katsinov') and Technology Readiness Level (TRL/'Tingkat Kesiapterapan Teknologi = TKT'). The method used is a participatory approach through Focus Group Discussions (FGD), where discussions are held with stakeholders for financing transportation infrastructure through the Sharia PPP financing scheme. The analysis was carried out to determine the level of readiness through the Katsinov and TRL self-assessment and then the results of the TRL self-assessment were confirmed to the respondents to determine the level of readiness. The output of this research is an analysis model for measuring infrastructure financing readiness through a Sharia PPP financing scheme with the results being Katsinov level 1 and level 3 TRL. This shows that this readiness measurement model needs to be improved so that stakeholders understand the benefits, at least it can be increased to Katsinov which is more than 1, and it would be very good if Katsinov 3 and its TRL became 8 or 9 so that related parties feel safe using the sharia PPP financing scheme.

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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 Tingkat Kesiapterapan Teknologi (TRL) atau Technology Readiness Level (TRL). Metode yang dilakukan dengan menggunakan pendekatan partisipatori melalui Focus Group Discussion (FGD), 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, PPP syariah, katsinov TRL

INTRODUCTION

The halal value chain at the global level is experiencing extraordinary development. Countries worldwide are starting to see this industry as an attractive opportunity to create economic growth. The main driver of the development in this industry is the increasing demand for halal products¹. This situation is driven by several reasons, such as the significant growth of the world's Muslim population², the increase in income levels and purchasing power of Muslim countries, the increasing trend of halal purchases among non-Muslim consumers³, Muslim

immigrants who live in minority areas but still uphold Islamic values. Dinar Standard (2020)⁴ estimates that global Muslim spending in 2019 on the halal industrial sector (including halal food⁵, media, leisure, modest and fashion, pharmaceuticals, cosmetics, and Muslim-friendly travel) will reach USD 2.02. This figure reflects growth of around 3.2% from 2018. As a country with the largest Muslim population globally, Indonesia has a pretty good record regarding its performance in the halal industry⁶. In 2019, Indonesia was ranked fourth on the Global Islamic Economic Indicator (GIEI) list, ahead of Malaysia, Saudi Arabia,

¹ 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.

² 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)

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

⁴ Dinar Standard. *State of the Global Islamic Economy Report 2020/2021: Thriving in Uncertainty*: Retrieved from <https://cdn.salaamgateway.com/reports/pdf/862e1c9a9d925c5cd6aacae31b0ea102e21778a9.pdf> (accessed on March 26, 2021).

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

⁶ 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.

and the United Arab Emirates (UAE)⁷.

Along with the increasing global demand for halal products, understanding the halal concept has also developed, including the development of adequate infrastructure to support accelerated growth and economic equity. However, there are limited funds and the government's ability to build and manage the required infrastructure. Fulfilling this need for infrastructure development requires contributions from various government and business entities. Therefore, a Government and Business Entity Cooperation (PPP) or 'Kerjasama Pemerintah dan Badan Usaha = KPBU' scheme was formed, allowing government and business entities to contribute according to the portion of their respective capabilities and expertise to support national infrastructure development. The government in this scheme can assist with project preparation, feasibility, funding, guarantees, and land acquisition, while business entities can contribute to financing, development, management, and maintenance. The implementation of PPP Projects that prioritizes transparency and fair risk sharing is in line with sharia principles so that all PPP Projects have the potential to be implemented in a sharia manner. However, to ensure that the entire scheme is run following sharia,

⁷ Dinar Standard. (2020). State of the Global Islamic Economy Report 2020/2021: Thriving in Uncertainty. Retrieved from <https://cdn.salaamgateway.com/reports/pdf/862e1c9a9d925c5cd6aacae31b0ea102e21778a9.pdf> (accessed on March 26, 2021).

contracts between related parties need to be identified for the PPP agreement and the guarantee. In addition, it is necessary to identify alternative sharia⁸⁹ funding that business entities can utilize.

Following the Indonesian Sharia Economic Masterplan 2019-2024, KNEKS¹⁰ seeks to build a sharia economic ecosystem that includes the halal industry, sharia finance, both commercial and social, and other supporting infrastructure such as the development of human resources, information systems, and economic digitization. KNEKS prioritizes cooperation and synergy with ministries/agencies, regulators, academics, researchers, practitioners, community organizations, and other relevant stakeholders in implementing strategic programs. The Indonesian Islamic Financial Architecture Masterplan (MAKSI) focuses on making Islamic finance a real strength for Indonesia. MAKSI recommends that Islamic finance contributes to national economic development in line with sharia

⁸ Alika, V. A.; Santoso, S.; Nurmaliki, S.; Anisa, N. (2021). 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. doi:10.4108/eai.28-9-2020.2307373

⁹ 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>

¹⁰ KNEKS (2020). Concept Note_KPBU Syariah_KNEKS-PT PII.

objectives and the priorities of the Indonesian government. The inclusion of Islamic finance into the mainstream of the national strategy will help the government achieve its development goals by attracting foreign investment to finance the necessary infrastructure projects. Potential investors include investors from the Gulf Cooperation Council (GCC) countries who want quality sharia investment products, local and international investors who want investment products for ethically and socially responsible projects, and other investors looking for class new assets to expand their investment portfolio. In addition, Islamic finance can also diversify sources of funds for the government. Several multilateral institutions supporting PPPs in Indonesia include the Islamic Development Bank, the Asian Development Bank, and the World Bank.

The main logistics activities, including transportation and warehousing, require infrastructure for airports, seaports, roads, railroads, and information and communication technology (ICT). Islamic Economics and Finance Development in Supporting Infrastructure Development. Optimization of Sharia PPPs through complete regulations and fatwas. PPP as an Alternative Solution for Infrastructure¹¹ Development.

¹¹ 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>.

Considering that infrastructure is a strategic project with long-term characteristics and large investments, the Government has innovated various financing schemes to build infrastructure through the PPP scheme. The PPP scheme in infrastructure development can be a solution to the limited government funds. The following points underlie the selection of a PPP scheme in infrastructure provision.

Types of Sharia Loan Contracts¹²:

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 needs in the 2020-2024 period where the value of this infrastructure investment increased compared to the 2015-2019 period¹³. This increase aligns with the government's general policy of accelerating infrastructure development to support economic growth and equity. Infrastructure development aims to strengthen national connectivity to achieve a balance of development, accelerate the provision of basic infrastructure (housing, clean water, sanitation, and electricity), and ensure water,

¹² KNEKS (2020). Concept Note_KPBU Syariah_KNEKS-PT PII

¹³ Rencana Pembangunan Jangka Menengah Nasional 2020-2024, Peraturan Presiden Republik Indonesia Nomor 18 Tahun 2020

food, and energy security. It is directed to support national resilience and developing urban mass transportation systems, all of which are implemented in an integrated manner and by increasing the role of cooperation between the Government and Business Entities. Limited government funds in the State Revenue and Expenditure Budget (APBN) and Regional Revenue and Expenditure Budget (APBD) are the government's obstacles in procuring basic infrastructure. Therefore, the government needs to find a breakthrough in the obligation to provide basic facilities and infrastructure.

The PPPs scheme can be implemented for infrastructure development under a sharia scheme. In this scheme, contracts between the government and business entities and financing acquisition must follow sharia principles. Business entities can obtain sources of funds from Islamic bank financing or Islamic financing institutions and the issuance of Islamic capital market securities. Investments with PPP projects as underlying assets will be in demand by investors. The projects are supported by preparation and guaranteed by the government to mitigate the risk. This can support the deepening of the Islamic financial market by increasing government projects funded by the Islamic finance industry. The implementation of PPP Projects that prioritizes transparency and fair risk sharing is in line with sharia principles so that all PPP Projects have the potential to be implemented

in a sharia manner. Referring to the PPP Book 2019 of Bappenas, many potential PPP projects with a total project value of IDR 67.8 trillion can be implemented using the Sharia PPP scheme.

Until now, there is one Sharia PPP that is currently underway, namely the Regional General Hospital Development Program, dr. Zainoel Abidin, Aceh and is the first Sharia PPP in Indonesia. The Sharia PPP is encouraged and based on the Provincial Government of the Special Region of Aceh (Qanun) rules and regulations, where all economic activities in Aceh must be carried out using Sharia principles. The implementation of the PPP Program by considering sharia principles, namely applying the basics of Islamic law relating to Islamic Engagement Law in agreements (akad) with the principle of Muamalah. Parameters of a sharia transaction, among others:

1. Do not carry out prohibited transactions in the provisions of Islamic law.
2. The provisions regarding this contract or transaction have been regulated in the fatwa of the MUI National Sharia Council and related regulations.
3. Based on Islamic morals in Muamalah.

Transactions between the Cooperation Project Responsible Holder ('Penanggung Jawab Proyek Kerja Sama = PJPK') and the Implementing Business Entity ('Badan Usaha Pelaksana = BUP'), including BUP transactions in obtaining financing for the implementation of sharia PPPs, are

carried out with contracts and schemes in various existing National Sharia Council Fatwas (DSN). In the Sharia PPP scheme, of course, the financing used by BUP must comply with sharia principles and prudential principles in banking. In this case, BUP can take advantage of financing from sharia banking, the sharia non-bank financial industry, or the sharia capital market. Business entities in the sharia PPP scheme can obtain funding from both sharia banking and the sharia capital market. Islamic banking can provide financing individually or syndicated with istishna contracts or other contracts that the DPS has approved.

Research Purposes

Identification of a Model for Measuring Readiness of Infrastructure Provision with a Sharia PPP Financing Scheme Using the IRL & TRL Concept Approach.

Planned Outcome Targets and Research Contribution

This study aims to identify a model for measuring the readiness of providing infrastructure with a Sharia PPP financing scheme using the IRL ('Katsinov') & TRL concept approach. The planned output target is the Infrastructure Provision Readiness Measurement Model with the Sharia PPP Financing Scheme Using the IRL & TRL Concept Approach is $TRL = 3$ and $IRL = 1$ for Sharia PPPs. This research is a research for TRL Social and Humanities based on regulations¹⁴¹⁵.

¹⁴ Regulation of the Minister of Research, Technology and Higher Education of the

METHODS

The approach used qualitative and quantitative approaches Mix Methods Research (mixed methods research). Using the explanatory sequential design, in the first stage, quantitative data analysis is carried out, followed by a quantitative analysis as confirmation. As explained in the previous section, we measure the readiness of infrastructure service providers¹⁶ in Indonesia in implementing halal value chain infrastructure services¹⁷¹⁸¹⁹²⁰ using the IRL & TRL by using

Republic of Indonesia Number 29 of 2019 concerning Measurement and Determination of Innovation Readiness Levels.

¹⁵ 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

¹⁶ 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>

¹⁷ 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*.

¹⁸ 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.

¹⁹ 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.

²⁰ Nadzmi, M.N., and Iskandar, M.L. (2020). Factors Influencing Adoption of Halal

the readiness of the Sharia PPP scheme. We conducted both quantitative and qualitative studies to measure readiness toward halal infrastructure²¹²² using the readiness of the Sharia PPP scheme. This research is a qualitative participatory that involves active participation among members of the community who become the targeted group.

A policy process is a form of the qualitative method to discuss how the relationship between science that appears in research and action is made. Policymaking is a multi-dimensional action with various aspects, so it requires an adequate resource person[1]. Various works of literature describe decision-making related to the policy²³²⁴ as an event of a group of decision-makers at a particular time and place to review an issue (or opportunity), consider several alternative patterns of action

by taking into account the advantages and disadvantages explicitly of each option, weighing various alternatives accordingly. With the goals and priorities, choose the most suitable alternative and is considered the best for realizing the goal. A qualitative approach with key informants is a policymaking official. There will be discussions/meetings/FGD and literature reviews where researchers conduct a series of studies involving various kinds of information from libraries such as books, encyclopedias, and documents. The qualitative approach is carried out by conducting several discussions to explore opportunities for implementing Sharia PPPs with resource persons including The Ministry of Public Works and Housing, 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.

Quantitative approach is carried out by descriptive analysis is a statistic used to analyze data by describing or describing the collected data without making generalized conclusions or generalizations. Descriptive statistics aim to obtain a picture of a particular situation based on actual observations by describing the respondent's response. Data collection is a segment of the data submission stage related to data sources and ways to obtain research data. To compile, complete and complete this research, theoretical data and appropriate,

Logistics among Warehouse Operators. *Journal of Halal Studies*,1(1), 42 - 55

²¹ 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.

²² Karia, N. (2019). Halal Logistics: Practices, Integration and Performance of Logistics Service Providers. *Journal of Islamic Marketing*,

²³ 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.

²⁴ 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.

clear and supportive information are needed to overview the real problem. In collecting data in this study, the researcher conducts research directly on the object of research to obtain the required data to complete the data, namely by The questionnaire is a data collection technique carried out by giving a set of questions or a written statement which is done by providing a set of questions on a written statement to the respondent to answer. The quantitative approach we take is to measure the readiness of infrastructure service providers in Indonesia to implement halal infrastructure services^{25,26}. The quantitative approach is carried out by conducting a self-assessment of the Innovation Readiness Level (IRL) and Technology Readiness Level (TRL) instruments given to 50 respondents with various fields of interest, Infrastructure, Islamic Finance, Financial Management, Operations Management, Marketing Management, and Human Resource Management.

We identify the problems regarding Indonesia's obstacles and challenges in increasing the readiness to implement halal

infrastructure service providers in Indonesia. The IRL readiness of the Sharia PPP scheme was used to assess the preparation of executing the Sharia PPP due to regulations, rules, guidelines, directions, and development targets or the existence of promotions and strategies that provide concepts in individual and collective decision making. The figure of research framework is shown in Figure 1:

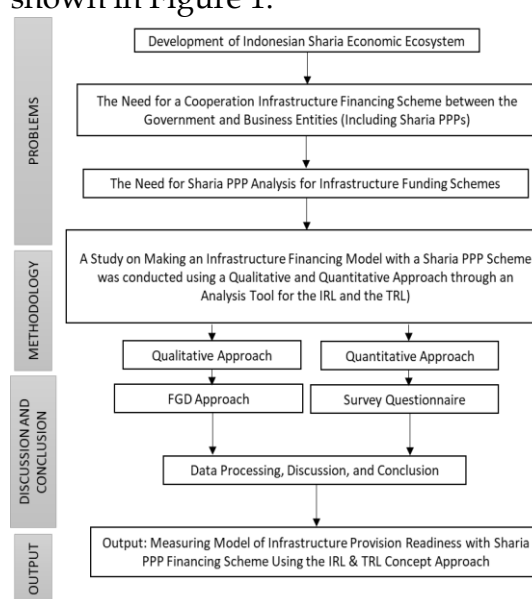


Figure 1. Research Framework

The population in this study is the number of Sharia PPP projects that have been implemented. The sampling technique in this research is purposive sampling. Purposive sampling according to Sugiyono is a sampling technique with certain considerations (Sugiyono, 2012). The criteria used in purposive sampling are respondents who have studied IRL (Katsinov) and TRL^{27,28,29,30,31} in

²⁵ 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.

²⁶ Lovika, A., Burhanuddin, B., Santoso, S., & Praktikno, I. (2022). Peran Literasi Keuangan Syariah Pada Pelaku Usaha Makanan Minuman Halal Terhadap Peningkatan Nilai Tambah. *Jurnal Pendidikan Dan Kewirausahaan*, 10(2), 655-667. <https://doi.org/10.47668/pkwu.v10i2.474>

²⁷ 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

the fields of work related to infrastructure, financial management (& Islamic finance), operational management, Human Resource management and marketing management.

RESULT AND DISCUSSION

Several important points were conveyed by KNEKS regarding Sharia PPPs as follows: In general, there are no infrastructure projects that violate sharia principles so that the PPP scheme can be implemented. However, the differences between existing PPPs and Sharia PPPs are

focused on 3 aspects (i) Cooperation Agreement ('Perjanjian Kerja Sama = PKS') between PJKP and BUP - Description: flexible. In general, existing PKS do not violate sharia principles. However, further confirmation is needed by the DSN MUI because the sharia contract is not explicitly written in the PKS, (ii) Guarantee agreement scheme and regress agreement - Description: important (differentiating existing PPP from Sharia PPP in the medium term), (iii) Financing or funding scheme - Description: emergency (critical point of differentiating existing PPPs from Sharia PPPs).

Discussion to determine the Level of Readiness of the Model for Measuring the Readiness of Infrastructure Provision with the Sharia PPP Financing Scheme Using the Katsinov and TRL³²³³³⁴³⁵³⁶ Self-

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>

²⁸ Andrean, D.; Santoso, S. (2020). 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), 60-69. DOI: 10.31933/dijms.v2i1.525

²⁹ 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

³⁰ 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.

³¹ RISTEKDIKTI (2018). Buku Petunjuk Katsinov Meter-Tingkat Kesiapan Inovasi. Lampiran 2, Nomor Surat: 112/F.F2/IN/2018, Tanggal Surat : 06 September 2018

³² 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.

³³ 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

³⁴ 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>

³⁵ Suhendri, D. Pawennei, I. Camil, R. Sudrajat, D. Wahyuni, N. Modul: Memahami Tingkat Kesiapterapan

Assessment Conceptual Approaches. According to the 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, Katsinov aims, among other things, knowing the state of readiness or position in the Innovation life cycle and reducing the risk of failure in the implementation of Innovation.

The results of Katsinov's self-assessment show that the Readiness of Providing Infrastructure with the Sharia PPP Financing Scheme is at level 1 (Katsinov 1). Risk management factors need to be improved through partnerships (risk assurance). There is still no clear concept because this Sharia PPP is a new thing which creates its own obstacles in its development. From the results of Katsinov's calculations, then analyzed with TRL type Social Humanities³⁷ where according to regulations is the level of maturity or readiness condition that is measured systematically so that it can be adopted by users, both by the government, industry and society.

Teknologi, RISETPro-Research & Innovation In Science & Technology Project

³⁶ 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

³⁷ 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

Self-assessment is carried out using measuring instruments IRL and TRL. TRL self-assessment is carried out with a total of 50 respondents, notes from the TRL Self Assessment are the self-assessment score for TRL 3 is 86.7 so that TRL 3 is fulfilled (with a minimum limit is 80) , the question of financing with the Sharia PPP scheme for a particular project: has the design methodology used based on the Sharia PPP scheme been prepared? If there is insufficient socialization, it is likely that the respondent will answer that they do not know or are hesitant or unsure even though the methodology design has been prepared, and the question of financing under the Sharia PPP scheme for a particular project: has a technical evaluation and prediction of implementation results been carried out? If the information and socialization is lacking, it is likely that the respondent will answer that they do not know or are hesitant or unsure even though the methodology design has been prepared.

Based on the analysis carried out to determine the level of readiness through the self-assessment of Katsinov and TRL^{38,39,40}

³⁸ 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

³⁹ Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 29 of 2019 concerning Measurement and

and then the results of the self-assessment of TRL were confirmed to the respondents to determine the level of readiness. The sampling technique in this research is purposive sampling. Purposive sampling according to Sugiyono is a sampling technique with certain considerations (Sugiyono, 2012). The criteria used in purposive sampling are respondents who have studied Katsinov and TRL^{41,42,43} in the fields of work related to infrastructure, financial management (& Islamic finance), operational management, HR management & marketing

Determination of Innovation Readiness Levels.

⁴⁰ RISTEKDIKTI (2018). Buku Petunjuk Katsinov Meter-Tingkat Kesiapan Inovasi. Lampiran 2, Nomor Surat: 112/F.F2/IN/2018, Tanggal Surat : 06 September 2018

⁴¹ Andrean, D.; Santoso, S. (2020). 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), 60-69. DOI: 10.31933/dijms.v2i1.525

⁴² 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>

⁴³ RISTEKDIKTI (2018). Buku Petunjuk Katsinov Meter-Tingkat Kesiapan Inovasi. Lampiran 2, Nomor Surat: 112/F.F2/IN/2018, Tanggal Surat : 06 September 2018

management. The number of respondents amounted to 50 people. The mechanism for filling out the questionnaire is via online/bitly.

CONCLUSION

Implementation of Sharia KBPU is still very small, a research is carried out related to the Measurement Model of Infrastructure Readiness of Sharia Service Providers for Practice Implementation in Indonesia. The research was conducted with qualitative⁴⁴ and quantitative approaches. From the FGD/meetings, it has been identified that the infrastructure financing scheme with PPP and its guarantee has been implemented, while the infrastructure financing scheme with Sharia PPP has been implemented for certain projects.

The Measurement Model of Readiness of the Provision of Infrastructure has been identified with the Sharia PPP Financing Scheme Using the IRL and TRL Concept Approach with the following results:

The level of readiness for infrastructure financing based on the Sharia PPP financing scheme with measurements of Katsinov level 1 and TRL level 3 has been met.

1. Katsinov level 1 shows risk management factors need to be improved with the use of technology and partnerships with various existing organizations so

⁴⁴ Denzin, Norman K. dan Yvonna S. Lincoln (eds.). 2009. *Handbook of Qualitative Research*. Terj. Dariyatno dkk. Jogjakarta: Pustaka Pelajar.

that the impact of risk does not increase. There is still no clear concept because this Sharia PPP is a new thing which creates its own obstacles in its development. For this, it is necessary to invest specifically in research and development so that the implementation of Sharia PPPs is right on target in accordance with the objectives, namely sharia financing for the provision of infrastructure in Indonesia.

2. The results of the respondent's questionnaire using purposive sampling showed that 60% of the respondents stated that the infrastructure financing scheme based on Sharia PPP financing had met the TRL level 3. The importance of completing the requirements, adequacy, and completeness of the Sharia PPP to support the readiness of infrastructure financing with the Sharia PPP scheme.

SUGGESTION

The suggestions/ Recommendation that can be given to support improvements for the Sharia PPP scheme are as follows:

1. The data required for the implementation of the Sharia PPP continues to be collected and used as the basis for the development of the Sharia PPP scheme
2. In the readiness of infrastructure financing based on the Sharia PPP financing scheme, more massive socialization and intermediation are needed so that stakeholders better understand Sharia PPPs because if not, it is possible that stakeholders will not know or hesitate or lack confidence in Sharia PPPs and their benefits.
3. Stakeholder synergy is required for the readiness of infrastructure financing based on the Sharia PPP financing scheme.
4. This shows (Katsinov level 1 and TRL level 3) that this readiness measurement model needs to be improved so that stakeholders understand the benefits, at least it can be increased to Katsinov 3 and TRL 8 so that users feel safe using the Sharia PPP financing scheme.

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