



Chapter 3

The Challenges of Infrastructure Development in Indonesia

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This chapter discusses infrastructure development in Indonesia after the 1997 Asian financial crisis. It focusses on Indonesia's challenges to improving its infrastructure, including the critical issues associated with the slow progress of infrastructure development and how the government has addressed these issues, including problems with land acquisition, poor intergovernmental coordination, and incompatible regulatory and institutional frameworks. It also discusses how President Joko Widodo accelerated development through the *Proyek Strategis Nasional* (PSN). It concludes by discussing the lessons learned from the PSN projects to accelerate the country's infrastructure development process, notably to boost private capital mobilisation and to improve expertise in executing infrastructure programmes.

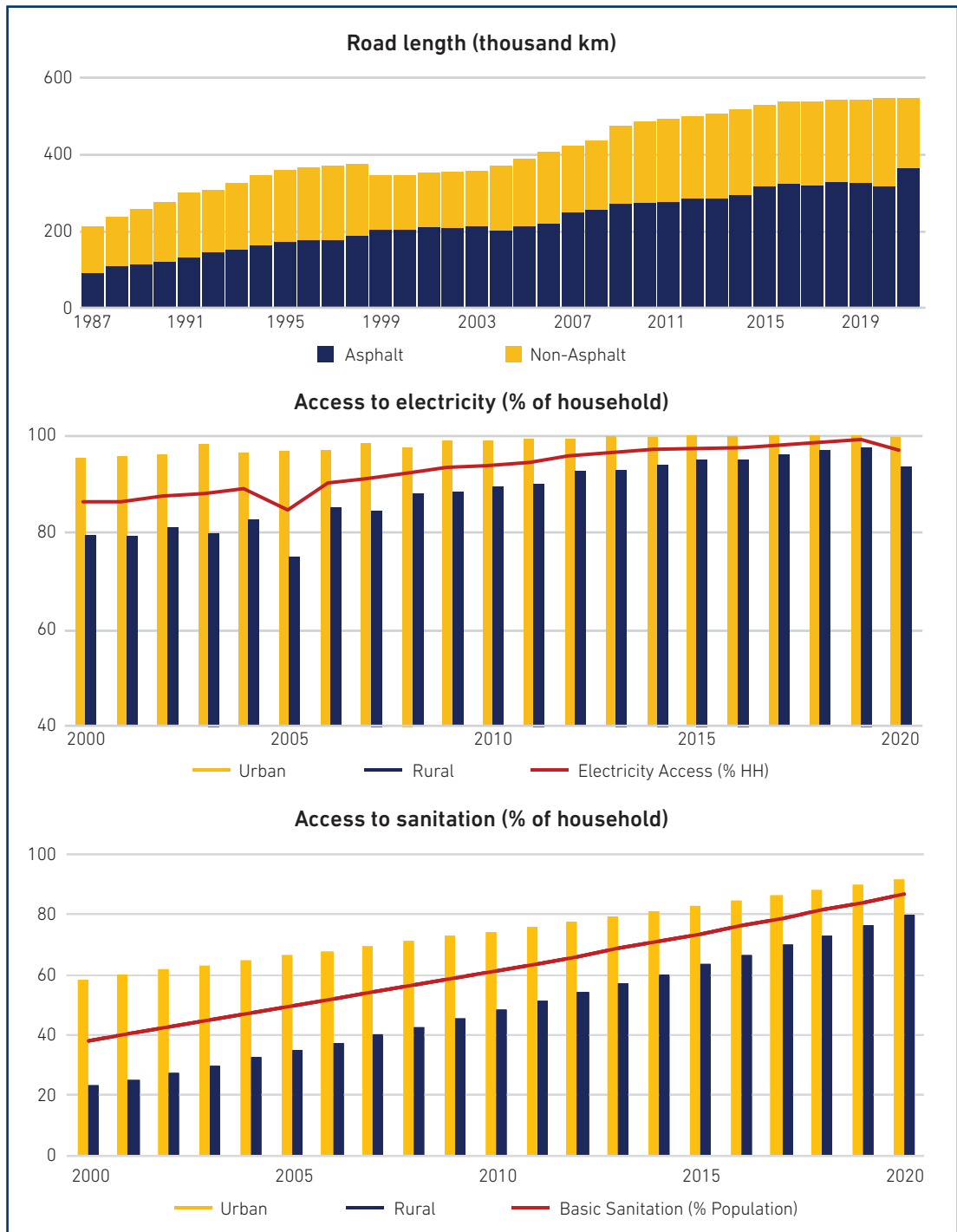
1. Background

Infrastructure plays a strategic role in facilitating economic activities and improving interregional connectivity. Infrastructure – defined here as broad physical structures and facilities, including transport, electricity, water and sanitation, telecommunications, and housing – is an indispensable factor in determining a nation's structural transformation process (ADB, 2017). It is also essential as it presents short- and long-term beneficial impacts. The availability of infrastructure allows more social interactions due to higher mobility, better access to public facilities, and promotion of equality amongst regions (Bhattacharyay, 2008, 2010; Runde, 2017). Good-quality infrastructure also lowers distribution costs (Wong and Tang, 2018). Further, the existence of infrastructure unlocks economic potential in regions, thus creating job opportunities and increasing welfare in general. It facilitates the exchange of ideas, fosters productivity, increases living standards, and cultivates social interactions.

Underinvesting in infrastructure, however, results in inconveniences and impedes higher economic growth (Salim and Negara, 2018). Immense funds are needed to finance infrastructure development, but finding a suitable source is only part of the solution. The dynamics of infrastructure development are affected by other factors such as politics, horizontal conflicts, and bureaucracy, which are often presented as additional barriers.

This chapter analyses the infrastructure development of Indonesia after the 1997 Asian financial crisis (AFC). The first part provides a brief overview of infrastructure development in Indonesia and how its investment compares to other developing countries. It also details infrastructure development post-AFC, including during the Joko Widodo Administration, focussing on *Proyek Strategis Nasional* (PSN). The chapter concludes by discussing the lessons learned, feasible strategies, and fundamental mechanisms that the government can adopt to accelerate the infrastructure development process further, particularly to boost private capital mobilisation and to improve expertise in executing the PSN.

Figure 3.1. Progress of Selected Infrastructure in Indonesia



Sources: Statistics Indonesia, Panjang Jalan Menurut Jenis Permukaan (km), <https://www.bps.go.id/indicator/17/51/1/panjang-jalan-menurut-jenis-permukaan.html> (accessed September 2, 2023), and World Bank, World Development Indicators, <https://databank.worldbank.org/source/world-development-indicators> (accessed 2 September 2023).

2. Development of Infrastructure Sectors

2.1. Progress in Infrastructure Outcomes

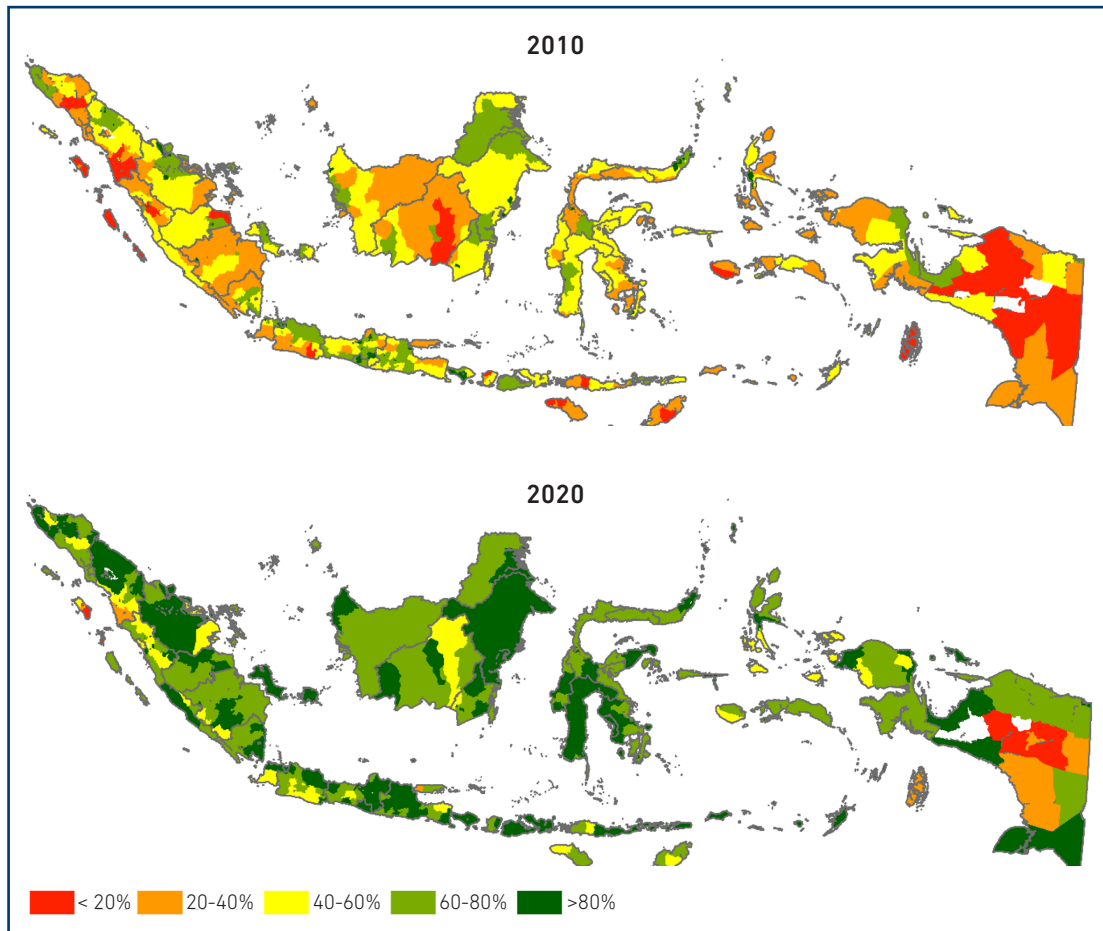
One important indicator reflecting infrastructure development progress is the length of roads. The length and quality of roads are associated with connectivity and accessibility amongst regions. Since the Suharto Administration, the length of roads has consistently increased, except for a small decline shortly after the AFC. On average, the length of additional roads constructed reaches about 10,100 kilometres annually (Figure 3.1). In 2021, out of 546,000 kilometres of roads constructed, 67% were asphalt roads. As a comparison, 298,00 kilometres were constructed 20 years ago, 45% of which being asphalt roads.

Another indicator of infrastructure development – electricity access – has also increased over time. In 2020, about 97% of households in Indonesia had access to electricity, rising from 88% in 2000 (Figure 3.1). A similar rising pattern is found in other indicators, such as basic sanitation. In 2020, the percentage of population with basic sanitation was recorded at 86.5% – much greater than only 38.0% in 2000. On average, the population with basic sanitation access in Indonesia grows 4.2% annually (Figure 3.1).

These figures also suggest that the gap between urban and rural populations remains, despite a narrowing trend in the last 2 decades, as those in urban areas have better access to electricity and basic sanitation than those in rural areas. In 2020, almost all urban households had electricity access (99.6%), while a lower percentage (93.5%) had electricity access in rural areas (Figure 3.1). Likewise, access to basic sanitation had higher rates in urban areas – 92% of urban households versus 80% of rural households (Figure 3.1).

While the urban and rural gap has coloured Indonesia's infrastructure progress, regional disparity is also a persistent issue. Taking access to basic sanitation as an illustration, regional disparity in infrastructure remains prevalent although it has decreased over the last decade (Figure 3.2.). Comparing the national socio-economic surveys in 2010 and 2020, basic sanitation access impressively improved from 57.3% of households in 2010 to 80.3% in 2020 (Statistics Indonesia, 2010, 2020). However, the figure also indicates a regional variation at the district level. Some districts – particularly in Eastern Indonesia – saw less than 20.0% of households with basic sanitation access in 2020.

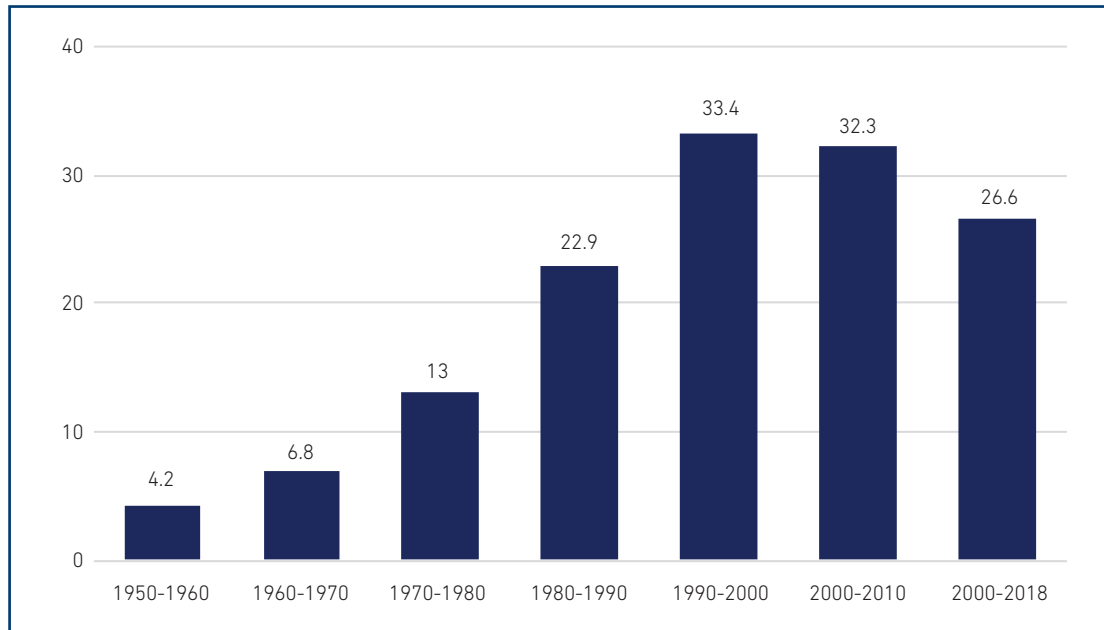
Figure 3.2. Regional Variation in Decent Sanitation Access, 2010 and 2020
(% of households)



Sources: Statistics Indonesia (2010, 2020).

The urbanisation trend also presents another challenge in providing equitable infrastructure. While the natural population growth has been a major contributing factor in the urban population increase, inequal access to public facilities between urban and rural areas and the lack of development in some regions have worsened the situation. These problems have forced an exodus to urban areas, thus creating issues such as urban poverty and inequality as cities become denser. With an additional 100 million people living in Indonesia's urban areas since early 1990s, Indonesia is categorised as having intermediate urbanisation (Figure 3.3).

Figure 3.3. Urban Population Increase in Indonesia by Decade
(millions of persons)

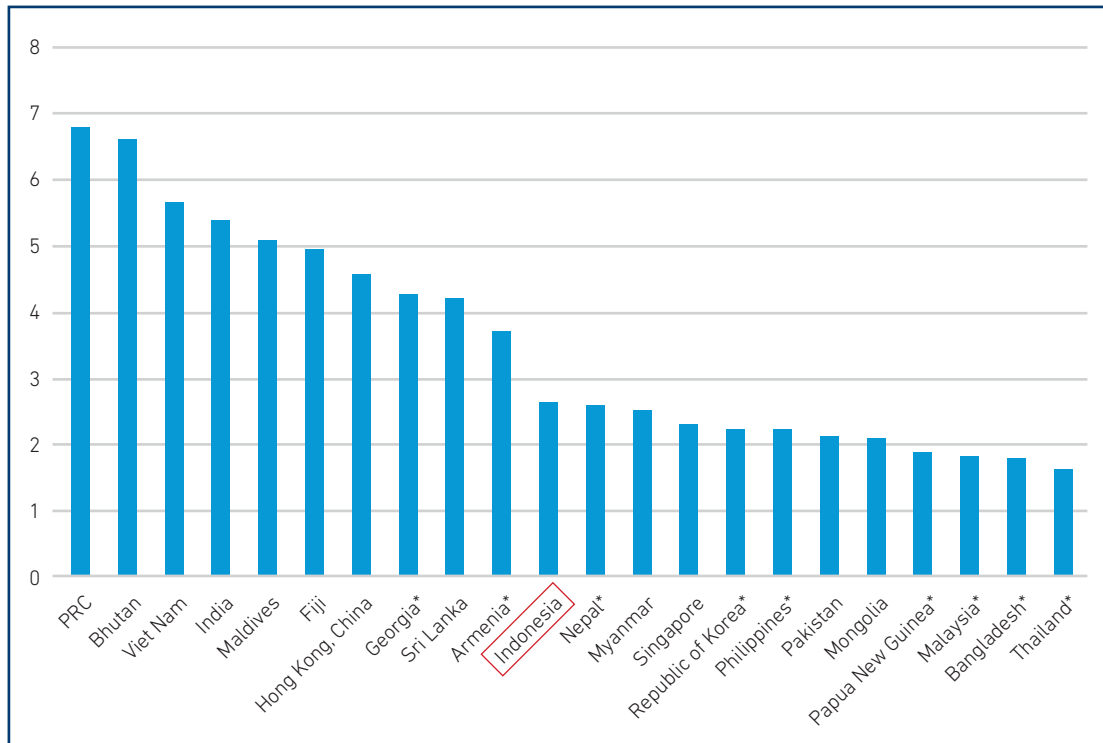


Source: United Nations, World Urbanization Prospects 2018, <https://population.un.org/wup/DataQuery/> (accessed 2 September 2023).

While there is no exact answer on how much Indonesia should invest in infrastructure, cross-country comparison suggests that Indonesia's infrastructure investments are relatively low. With average infrastructure investment of approximately 2.5% of gross domestic product (GDP), Indonesia's rate is on par with that of Myanmar and lower than those of Viet Nam, India and China (Figure 3.4).¹

¹ A similar pattern also appears when comparing the gross fixed capital formation value, where Indonesia ranked the lowest amongst other selected countries. However, the figure does not include investment by sub-national governments, which could increase the overall nominal investment (ADB, 2017).

Figure 3.4. Infrastructure Investment in Asia, Various Years
(% of gross domestic product)



PRC = People's Republic of China.

Note: *Central government budget only.

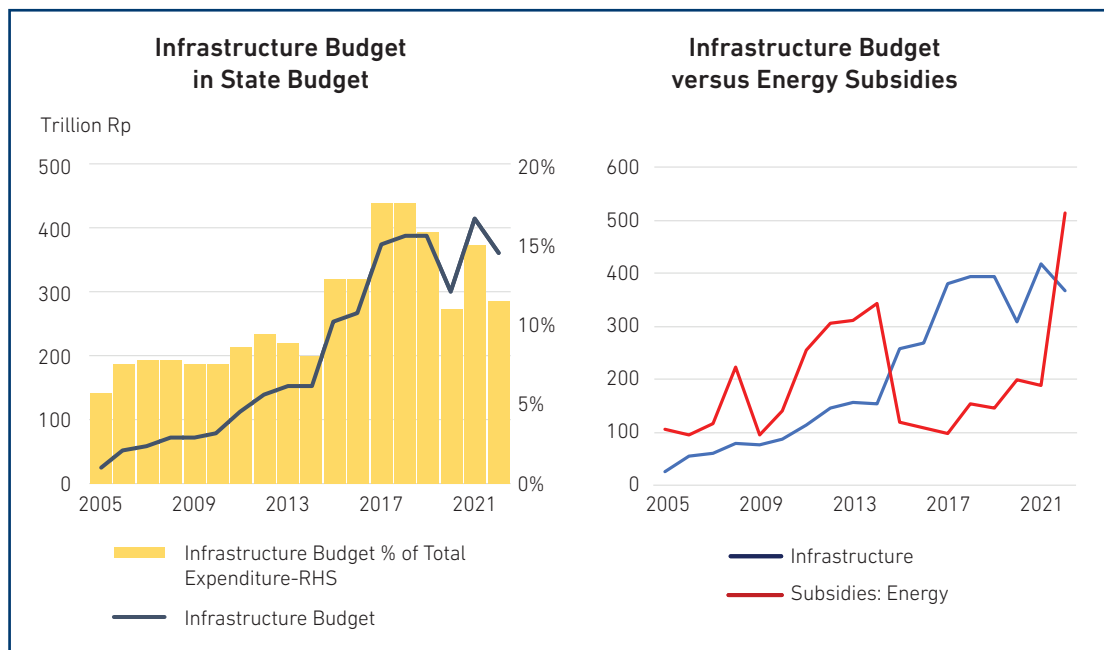
Source: ADB (2017).

Another challenge for Indonesia in sustaining infrastructure development is its heavy reliance on public funding. During the 1970s to 1980s, the Suharto Administration allocated 30%–40% of the State Budget towards infrastructure development. Then, Indonesia was hard hit by the AFC; allocated funds for infrastructure declined from around 9% of GDP before the AFC to about 2% of GDP in 2001 (OECD, 2015). The result was a dramatic decline in Indonesia's infrastructure availability and quality. After the AFC, Indonesia struggled to find sustainable sources to finance its infrastructure development given the immense development needs to be supported by the State Budget. Indonesia has not experienced any significant recovery in infrastructure investment, except for a slight lift in 2008 (Roberts, Gil Sander, Tiwari, 2018). By 2015, the allocated infrastructure investment share of the State Budget remained below 3% of GDP.

2.2. Widodo Administration Policy on Infrastructure Development

Under the Joko Widodo Administration, the government committed to accelerating infrastructure development under nine priority programmes called Nawacita, which were officially incorporated into the Rencana Pembangunan Jangka Menengah Nasional (Medium-Term National Development Plan, RPJMN), 2015–2019. The RPJMN, 2015–2019 stressed the need to advance inter-island connectivity, improve the distribution network with roads and railways, and meet sufficient energy and food supply needs. To achieve the goal of accelerating infrastructure development, the RPJMN, 2015–2019 noted financial needs of approximately Rp4,796 trillion. For the State Budget, by 2015, the infrastructure budget only reached Rp256.1 trillion, around 13% of the State Budget's total expenditure (Figure 3.5). This amount was higher relative to years before the Widodo Administration, when the share of the infrastructure budget ranged from 6% to 9% of the total expenditure.²

Figure 3.5. Indonesia's Infrastructure Budget, 2005–2021
(Rp trillion)



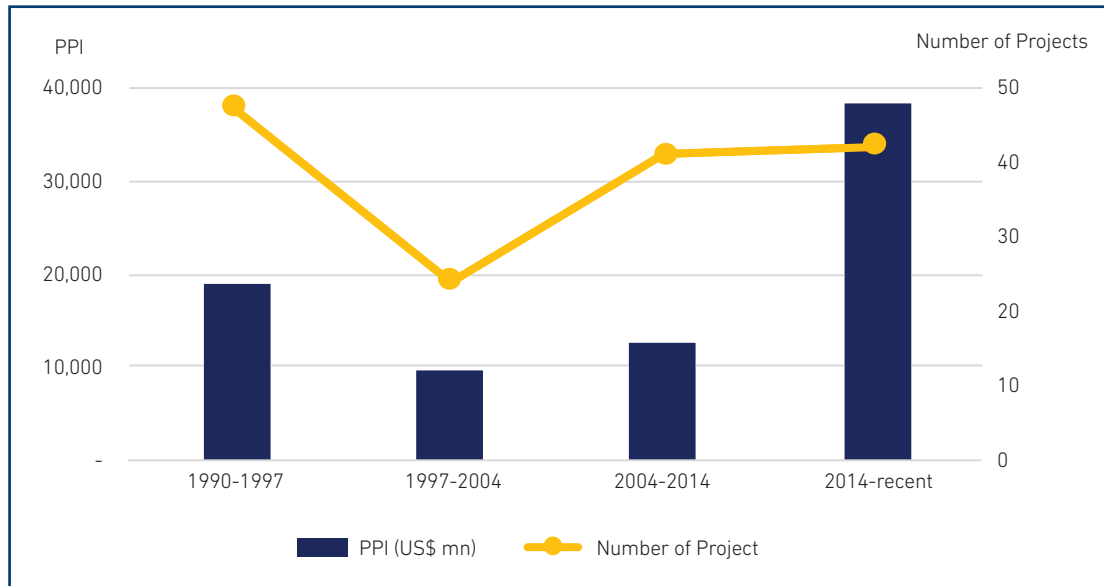
Sources: MOF and ADB (2017).

² The more significant allocation for infrastructure was a result of a massive cut in fuel subsidies, creating a relatively larger fiscal space. However, there was a sudden increase in energy subsidies in 2022 to address the lower purchasing power associated with the pandemic. Yet, these subsidies were partly reduced by September to maintain budget sustainability.

Nevertheless, relying on public funds for infrastructure development was insufficient. The RPJMN, 2020–2024 states that infrastructure financing needs are increasing to Rp6,445 trillion, a sum that cannot be met solely through public funds or state-owned enterprises (SOEs), which cover only 37% and 21% of the total required, respectively. To close the gap in financing, the government thus aims to incorporate more participation from private entities through public–private partnerships (PPPs), which involves private participation in project financing, development, and management. By implementing PPP schemes, the government also anticipates optimising public services, attracting competitive businesses for procurement, and enhancing access to global financing through transparent selection processes and investment competition (Minister of National Development Planning/ Head of National Development Planning Agency, 2023).

Before 2014, private participation in PPP schemes was relatively low. However, since the Widodo Administration, Indonesia has seen a surge in private participation, amounting to \$38 million, a three-fold increase from 2004–2014 (Figure 3.6.). Thus, it can be concluded that the role of the private sector in Indonesia's infrastructure has improved relative to past trends.

Figure 3.6. Private Participation in Infrastructure
(\$ million)



PPI = private participation in infrastructure.

Source: World Bank.

3. Challenges and Issues in Infrastructure Development

What are the primary reasons for the sluggish advancement of infrastructure in Indonesia? This chapter identifies at least five key factors that have given rise to the challenges leading to underinvestment in infrastructure.

3.1. Land Acquisition

The complicated and time-consuming process of land acquisition has frequently impeded infrastructure development in Indonesia. Infrastructure development is often delayed by years or halted because of the slow-moving land acquisition process. The government has provided a legal basis to acquire land for national development as well as improvements to administrative procedures and legal resolutions pertaining to land procurement disputes. However, several issues remain, including:

- (i) **Definition of public interest.** There is set of criteria outlining the types of infrastructure that serve the public interest, but these criteria may not necessarily align with the interests of local authorities or communities. Often, such parties oppose a project or demand significantly higher compensation prices. For instance, the Bedugul Geothermal Development Project in Bali was denied by the provincial government because it had the potential to disrupt the ecosystem of a regional water catchment area, and the construction phase of the Batang Asai Dam Project in Jambi Province was delayed by 2 years due to the failure of the local community and the central and regional governments to reach an agreement.
- (ii) **Method and basis for calculating compensation for landowners.** The basis for calculating compensation for land acquisition is limited to physical losses (e.g. land, buildings, and crops), while non-physical sociological losses are ignored. The existing regulations do not guarantee that landowners will live better than they did before transferring their land rights to the government.
- (iii) **Mechanism for acquiring land.** Inconsistencies can occur between land acquisition planning documents for national infrastructure projects and regional spatial planning documents (e.g. if the land acquisition site is within the forest zone declared by regional governments), which can impede infrastructure development.

3.2. Coordination between Governments

The key to interregional infrastructure development is effective collaboration between the national and sub-national governments from the planning phase to implementation. This is difficult to achieve, however, because each level of government has sectoral views and different perspectives regarding infrastructure development authority and responsibilities. Delays and complexity in the application process for a spatial permit or approvals for investment – as well as low levels of political willingness to provide funding – are examples of the consequences of ineffective coordination between national and sub-national governments.

Prior to 2014, the government established a committee to coordinate national–regional infrastructure provision policies known as Komite Kebijakan Percepatan Penyediaan Infrastruktur (Committee for Policy on the Accelerated Provision of Infrastructure). However, the national government observed the need for enhancing the committee’s decision-making authority; limited roles in all phases of the project, from planning to construction; lack of flexibility to provide incentives and disincentives to accelerate projects; and a too-large structure, resulting in ineffective decision making. In 2014, the committee was reformed to become the Komite Percepatan Penyediaan Infrastruktur Prioritas (Committee for Acceleration of Priority Infrastructure Delivery, KPPIP) through Presidential Regulation No. 75/2014. KPPIP was established to serve as a single point of contact for all government agencies, potential funders, and private sector investors for infrastructure initiatives deemed to be of strategic importance.

3.3. Regulatory and Institutional Framework

Infrastructure planning in Indonesia involves various ministries, agencies, and sub-national governments to ensure that both top-down and bottom-up processes are operating concurrently, resulting in complex coordination and even overlapping planning, regulations, and priorities across government bodies. Involving numerous parties in the planning process for infrastructure provision policies often prolongs it, thus making businesses unable to operate efficiently and effectively. For example, more licenses and permits must be obtained to complete the bureaucratic administrative process. In this regard, simplifying the regulatory and institutional framework can aid in accelerating infrastructure development.

3.4. The Availability of Long Term Financing Instruments

Financing is a crucial factor in the success of infrastructure projects. One of the main challenges for infrastructure development is the mobilisation of financial sources to fund projects, as the government has limited fiscal space for infrastructure spending. Infrastructure projects are capital-intensive with a relatively long payback period. Therefore, such investment needs long-term financing sources to ensure steady long-term cashflows. The national government had been prompted to design alternative financing schemes for infrastructure projects to attract private sector participation – aside from multilateral loans and bonds – to bridge the funding gap. However, the financing strategy is not operating as initially envisioned, especially in cases where an infrastructure project is economically feasible but lacks financial viability. As the concept of PPPs was introduced as a policy innovation to address the funding difficulties associated with infrastructure projects, there is now an opportunity to address delayed infrastructure projects. However, there are various challenges associated with implementing long-term financing instruments or schemes in Indonesia, including:

1. Implementing non-recourse debt in project finance schemes remains challenging in Indonesia due to lenders' preferences for collateral, such as assets or sponsors, particularly in new sectors and untested schemes lacking proven precedents.
2. The 'estafet financing' scheme faces challenges as its market realisation has not taken shape, despite the potential financing capacity of financial institutions for infrastructure in the secondary market. Obstacles for the non-bank financial industry in infrastructure investment include meeting high current-year targets. Additionally, infrastructure projects are sometimes still under construction or in the land development stage (greenfield) (Kartika Sari, 2017).
3. It is crucial to optimise capital market instruments such as mutual funds, asset-backed securities, and sharia-compliant instruments for infrastructure financing. There is also a need to issue and enhance regulations that enable the issuance of new capital market instruments, including Perpetual Bonds, Infrastructure Bonds, and Project Bonds, to facilitate financing for infrastructure development (OJK, 2017).

3.5. Public and Private Sector Capacity and Public Awareness

The public sector capacity plays a crucial role in ensuring fiscally responsible infrastructure development, especially considering the scale of ambitious infrastructure development plans, which require significant financial resources. This requirement often surpasses the resources that can be solely allocated from the State Budget. To meet the challenge of financing extensive infrastructure projects without overburdening the state budget, public entities should actively explore alternative funding sources. The process should also seek alternative funding sources

so as not to create excessive dependence on SOEs and impose a significant financial burden on businesses. This will diversify financial resources, reduce fiscal strain, and tap into innovative financing mechanisms, such as public–private partnerships (PPPs) and other creative financing schemes, to help bridge the funding gap and promote sustainable infrastructure development.

Investing in comprehensive capacity-building initiatives is also essential for enabling the public sector to grasp the intricacies of innovative financing mechanisms and adeptly manage and oversee these projects. A collaborative approach involving various stakeholders, such as the central government, the SMV within the Ministry of Finance, and esteemed academic institutions, can provide the resources and expertise needed to support these endeavours. In addition, the literacy of creative financing for infrastructure projects is not limited to the central government; it extends to a wide range of stakeholders, including the general public, financial institutions, and many others. A community of practice platform can provide a valuable forum for stakeholders from different sectors to share knowledge, collaborate on projects, and learn from each other's experiences. This process can enhance public awareness of infrastructure development, garnering stronger support for infrastructure initiatives.

4. The PSN as a Catalyst of Infrastructure Development

4.1. Legal Basis

In light of Indonesia's urgent infrastructure requirements and related challenges, the government needs to hasten the execution of PPPs. This accelerated process is primarily conducted within the PSN framework. President Widodo issued Presidential Instruction No. 1 of 2016 to take necessary steps for the acceleration and support of the PSN. In response, the government introduced Presidential Regulation No. 3 of 2016 to accelerate projects that fulfil basic needs and enhance the welfare of the population. Since its inception, this regulation has been amended three times with the aim of accelerating regional infrastructure development. The most recent amendment was Presidential Regulation No. 109 of 2020, which granted stimulus measures to PSN projects in the form of 0% tariffs for land and building rights acquisition fees. Additionally, the government established Government Regulation No.42 of 2021 as the legal foundation for the incentives accessible to central government, regional governments, or private entities engaged in PSN Projects.

This amendment also provides a legal basis for the Coordinating Ministry of Economic Affairs to make necessary updates to PSN projects. In essence, the list of PSN projects was annexed in this latest amendment, with provisions for further amendments based on studies to determine feasibility conducted by KPPIP. The results of this evaluation are reflected in the Regulation of the Coordinating Minister for Economic Affairs No. 7 of 2021, which was last amended by the Regulation of the Coordinating Minister for Economic Affairs No. 21 of 2022. The PSN list incorporates additional projects suggested by the central government, regional administrations, or private entities. These projects are vetted by KPPIP against a set of criteria that includes strategic value, interregional linkages, existing infrastructure, and project completion timelines. Inclusion on the PSN list provides numerous benefits, such as hastened progress, since any regulatory or permit-related impediment must be addressed by pertinent ministers, governors, and regents. Furthermore, these projects enjoy expedited land allocation and are ensured political security. Projects that have been successfully completed are removed from the PSN list during each amendment.

The government further enacted Government Regulation No.42 of 2021, aimed at expediting the implementation of PSN projects, with a particular focus on enhancing community services through the development of strategic infrastructure. This regulation is designed to facilitate the central government, regional governments, and businesses in this endeavour.

In support of the ease of implementation of the PSN, the government has demonstrated its commitment by establishing additional supporting regulations on special economic zones (Government Regulation No. 40 of 2021); simplification of land procurement procedures (Government Regulation No. 19 of 2021); easing land acquisition in forested areas (Government Regulation No. 23 of 2021); and streamlining the resolution of spatial planning inconsistencies (Government Regulation No. 43 of 2021).

The PSN can be characterised as an all-inclusive programme, devised to steer Indonesia's socio-economic growth towards the ambitious Golden Indonesia 2045 target. It embodies a commitment to sustainable, balanced, and fair economic development that harmonises immediate requirements with the nation's long-term objectives. By involving all relevant stakeholders, it strives to ensure that the fruits of economic growth reach all strata of society. The crucial features of the PSN can be detailed as follows:

- (i) **Goals.** Projects undertaken by the central government, sub-national governments, and/or business entities must be of strategic significance in boosting economic growth and promoting equitable development with the aim of advancing societal well-being and regional progress. PSN projects are executed in line with the country's development policies and priorities. These consider the requirements, advantages, and supportive capabilities necessary for the effective operation of these strategic projects. Furthermore, they also consider the interlinkages between infrastructure and/or hubs of economic activity.

- (ii) **Strategic nature.** The strategic essence of the PSN encompasses government leadership, intersectoral collaboration, and requisite stakeholder engagement. Indeed, government leadership plays a pivotal role in guiding and coordinating PSN initiatives by defining the strategic pathways, allocating funds, and formulating the essential regulatory structures. When considering intersectoral collaboration, PSN initiatives often span across several sectors and necessitate cooperation amongst diverse government departments, private sector entities, and other stakeholders to leverage varied expertise and resources. Moreover, the participation of stakeholders is vital for their success. Stakeholders can include communities, civil society organisations, affected industries, and other pertinent parties whose involvement aids in ensuring that the project caters to their requirements and addresses their concerns.
- (iii) **Project governance framework.** The government ensures that PSN projects are effectively supervised, monitored, and communicated while maintaining adaptability to dynamic circumstances. A project governance framework encompasses accountability and transparency measures as well as stakeholder engagement, all of which are critical for the success of these strategic initiatives. It incorporates a robust governance accountability system, which includes oversight, investigative audits, loss estimation, post-audit supervision, and assistance in the procurement of goods/services. The government maintains scrutiny over the progression of PSN projects and conducts regular evaluations to measure their impact. Frequent assessments aid in identifying any discrepancies or shifts from initial plans, enabling necessary amendments to keep projects aligned with their goals. Open and effective communication with the public is indispensable; the government is obligated to offer regular updates, initiate dialogue with stakeholders, address their concerns, and uphold transparency throughout a project. Given the dynamic nature of PSN projects, they often demand flexible and adaptive management. Any changes in external conditions, emerging technologies, or unexpected challenges may call for modifications in project scope, timeline, or methodology. As such, the government should be prepared to adjust and to respond accordingly.
- (iv) **Scope and criteria.** As per the Regulation of the Coordinating Minister for Economic Affairs of the Republic of Indonesia No. 21 of 2022, PSN projects are organised into 14 sectors and 12 national strategic programmes. Broadly, the 14 sectors can be categorised into three types of infrastructure groups: connectivity economic infrastructure, non-connectivity economic infrastructure, and social infrastructure. The list of PSN projects is periodically evaluated to meet the national objectives. Connectivity economic infrastructure encompasses a range of infrastructure such as road, rail, sea, air, and land connectivity, inclusive of their related infrastructure. Non-connectivity economic infrastructure includes a variety of economic infrastructure beyond connectivity, comprising drinking water and sanitation, dams and irrigation, energy, technology, tourism, and plantation infrastructure. Lastly, social infrastructure encompasses a spectrum from regional and housing sectors to the educational sector. The programmes should also align with national/regional medium-term development plans and spatial and regional guidelines. Projects should have a strategic influence on the economy, social welfare, national defence, and security, and foster connectivity between regions. Moreover, these initiatives should play a strategic role in stimulating regional economic growth.

- (v) **Financing and funding.** Financial planning for these initiatives can draw upon the State Budget, regional budgets, other valid funding sources, or a combination. Mechanisms such as PPPs and/or other collaborative financing strategies, can also be used in line with legal regulations (See Chapter 3 for a detailed discussion on innovative funding). PPP funding for PSN initiatives can be based on initiatives from the government or business entities. If a PPP is driven by a business entity, the entity must submit a feasibility study for the proposed PSN project, which may include aspects like public service infrastructure provision, optimisation of state- and regional-owned goods, enhancement of SOE assets, and/or augmentation of state and/or regional revenue. To enhance the feasibility and bankability of projects, the government offers various facilities, including the Project Development Facility (PDF), viability gap funding (VGF), financing guarantees, tax incentives, availability payments, and the Revolving Land Fund.

4.2. Institutional Support for the PSN

For the successful execution of the PSN, the involvement of various actors is critical. As stipulated by Government Regulation No. 42 of 2021, PSN projects entail several stages: planning, preparation, transaction, construction, and operation and maintenance. Different agents contribute to each stage, streamlining the process and ensuring smooth facilitation. Table 3.1 summarises the principal public agencies, institutions, and firms associated with the PSN.

Table 3.1. Principal Public Agencies, Institutions, and Firms Supporting the PSN

	Key Actors	Function
Government Agencies	Coordinating Ministry for Economic Affairs through Committee for the Acceleration of Providing Priority Infrastructure (KPPPI)	Facilitates coordination in the efforts to alleviate bottlenecks for the PSN and priority projects.
	Ministries/Institutions/Local Governments	Offers governmental budgetary support and assistance.
	Ministry of National Development Planning (BAPPENAS)	Creates regulations for PPP projects.
	National Public Procurement Agency (LKPP)	Guarantees the integrity of transactions and equitable bidding processes for PPP projects.
	Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, and Ministry of Marine Affairs and Fisheries (KKP)	Provides recommendations concerning the suitability of land and sea activities for a project.
	Ministry of Environment and Forestry	Facilitate land acquisition in forested areas for the PSN.
	Other Ministries/Institutions/Local Governments	Acts as the responsible party for the PSN within its jurisdiction.

	Key Actors	Function
Supporting Institutions	PT Sarana Multi Infrastruktur (SMI)	Offers financial support for infrastructure and consultancy services for PPP projects.
	Indonesia Infrastructure Finance (IIF)	Offers investment for infrastructure and consultation services for PPP projects.
	Indonesia Infrastructure Guarantee Fund (IIGF)	Provides sovereign guarantee and project development services for PPP and PSN projects.
	Asset Management Agency (LMAN)	Provides funding for land acquisition for the PSN.

PPP = public-private partnership, PSN = Proyek Strategis Nasional.

Source: Authors.

- (i) **Project Planning.** After the projects are listed, they are in the planning stage. Planning facilitation includes identification of permits and non-permits, spatial plans, land acquisition, use of forest areas, sector master plans, and financing planning. The establishment of Coordinating KPPIP serves as a pivotal step towards enhancing effective coordination and resolving issues arising from the lack of harmonious collaboration among various stakeholders. Its primary objective is to act as a coordinating unit, streamlining decision-making processes and facilitating debottlenecking efforts for National Strategic Projects and Priority Projects. Chaired by the Coordinating Minister for Economic Affairs, the Committee comprises key representatives from high-level essential institutions, including the Minister of Finance, Minister of PPN (National Development Planning)/Head of Bappenas (National Development Planning Agency), and Minister of Agrarian Affairs and Spatial Planning.
- (ii) **Project Preparation.** The preparation phase puts into action the plans laid out in the previous stage by supplying necessary documents such as the feasibility study, spatial planning compatibility, land acquisition determination, environmental report, and financing sources. Thus, the previously mentioned actors involved in the planning stage also contribute to this phase. While ministries, institutions, and/or sub-national governments are responsible for generating the required documents, KPPIP acts as a coordinator, and MOF steps in to explore different financing mechanisms, such as domestic and international loans, bonds, sovereign wealth funds, and private investments. It assesses the financial feasibility of projects, negotiates loan agreements, and oversees disbursement and repayment processes. The PDF acts as a facility to enhance the effectiveness of the preparation and transaction process, if necessary.

- (iii) **Project Transaction.** The next stage involves transactions using PPPs. Significant roles are performed by the National Development Planning Agency (Bappenas), MOF, and Lembaga Kebijakan dan Pengadaan Barang/Jasa Pemerintah (National Public Procurement Agency, LKPP). These institutions are responsible for regulating, executing, and monitoring the PPP, from the project's planning, financial, to procurement aspects. Through PT Penjaminan Infrastruktur Indonesia (PT PII), MOF also manages associated financial risks. It conducts risk assessments, develops risk mitigation strategies, and establishes mechanisms to monitor financial risks throughout the project lifecycle. It also utilises the IIGF or PT PII as the fiscal tool in managing risks from the sovereign guarantee provided to PSN projects, including those using PPPs. Ministries, institutions, and/or sub-national governments serve as the executing bodies of the project, while KPPIP functions as the coordinating entity, ensuring efficient execution.
- (iv) **Project Implementation.** Ministries, institutions, and/or sub-national governments that act as the government institution responsible for the project implementation based on their authority control the construction stage. During implementation, KPPIP monitors the project. Ministries, institutions, and/or sub-national governments shoulder various responsibilities in developing the operation and maintenance protocols for a PSN project. Upon the conclusion of the collaboration between governmental entities and the private sector, the project assets transition from private assets to being state and regionally owned assets, a process overseen by MOF.

4.3. Lessons Learned

In this section, lessons learned from the PSN framework will be provided in dealing with the challenges previously mentioned, such as land acquisition, government guarantees, risk mitigation, SOEs capacity, and public supports.

Land acquisition should be accelerated through a dedicated government body. Land acquisition is a substantial expense to the PSN. LMAN serves as a solution for the land acquisition problem in PSN projects. However, if land acquisition processes are drawn out, the project may be delayed, escalating total costs due to the price of the land, legal expenses, costs associated with resettlement or compensation of existing landowners, and other relevant expenditures, thus potentially impacting the financial feasibility of the project. To enhance the accountability and efficiency of the PSN pertaining to the land acquisition process, the formulation and implementation of more stringent regulations and laws aimed at expediting land acquisition are essential.

Government support and financing facilities must be plentiful. To underscore the government's commitment to the PSN, various forms of assistance and facilities are provided to increase the feasibility and attractiveness of projects, including the IIGF, PT SMI, PT IIF, and LMAN. In addition, the government provides supportive measures and technical assistance through VGF and the PDF, along with government guarantees and an availability payment scheme in addition to user fees for new returns on PSN investments using PPPs.

Projects with high social and economic impacts must be commercially feasible to attract private sector participation. However, since not all these projects are financially feasible, government guarantees are needed. PT IIGF provides a guarantee for the PSN projects, while PT SMI offers innovative financing through cash-deficiency support. Nevertheless, in some projects, these support mechanisms and facilities may be insufficient to counteract selective involvement exhibited by the private sector. To address these challenges, it is recommended that the government extend more comprehensive support to other sectors, not only those demonstrating high economic and social impacts but also those that are financially promising. By doing so, it could stimulate more active and diverse private sector involvement in the PSN.

Risks should be mitigated. There are unpredictable risks from government factors such as political and regulatory changes, external factors such as demand and unforeseen circumstances, or from the project itself (e.g. engineering, construction, and operation and maintenance) that may increase the vulnerability of a PPP-based project contract. Major improvements in the PPP regulatory framework by Presidential Regulation No. 38 of 2015 allow risk management to be allocated to both parties.

Additionally, the government implements relational contracts that allow internal or non-court renegotiation when unforeseen risks happen. For example, the IIGF was created as market solution insurance for central or regional government risks in PPP projects, which helps provide contingency support and guarantees against government-related financial risks to private entities. Specifically, the IIGF guarantees the government contractor agency's financial obligations by paying compensation to business entities when infrastructure risks arise in accordance with the allocation agreed in the PPP agreement.

SOEs should be carefully selected according to capacity and quality. The national government, represented by PT SMI, entrusts specific SOEs to participate in the PSN via an assignment scheme. For example, PT Hutama Karya and PT Kereta Api Indonesia were assigned to the Trans-Sumatra Toll Road project and the Light Rail Transit Jabodetabek project, respectively. The PSN initiative must be delegated to the proper SOE, which must possess the required expertise, good financial stability, and good corporate governance. Given that many PSN projects are financially unfeasible but have significant social and economic impacts, the distribution of projects should not harm the financial stability of the assigned SOE. Additionally, implementing good corporate governance, which includes accountability and transparency, at every stage of infrastructure project development, is key as monitoring project progress is crucial to ensuring that the project can proceed as intended.

There should be adequate public awareness and support. Infrastructure development without adequate efforts to raise public awareness will increase the likelihood that local communities will reject infrastructure projects. For instance, the government had to remove the Tiro Dam project in Pidie Regency (Aceh) from the PSN list in 2022 due to massive local opposition. The government was forced to select an alternative location to minimise conflicts with local people, delaying the project's start. Box 3.1 illustrates some lessons learned from the PSN project on the water supply system in Umbulan.

Box 3.1. Complexity in Delivering High Social Impact Project but Financially not Feasible: Case Study of the Umbulan Water Supply Distribution System

The Umbulan Water Supply Distribution System (known as the Umbulan SPAM) is the first urban water infrastructure project administered by the central government in Indonesia that successfully employs the public–private partnership (PPP) financing model. The objective of the project is to increase the clean piped water supply in five municipalities or regencies in East Java that form the Surabaya Metropolitan Area (i.e. Gresik Regency, Pasuruan City, Pasuruan Regency, Sidoarjo Regency, and Surabaya City) by using a spring in Umbulan Village, located about 17 kilometres from Pasuruan. The Umbulan SPAM includes construction of a raw water intake building, transmission pipelines, pump houses, offtake units, reservoirs, and a main distribution network. Moreover, it is a PSN project under Indonesia's national planning for 2020–2024, which aims to increase access to safe drinking water for 100% of the country's population by 2024 by improving piped water services.

The Umbulan SPAM has had a long history of development. From 1970 to 1972, the East Java provincial government initiated actions to utilise a spring in Umbulan, a valuable natural asset for local communities, providing fast-flowing, pure water and green scenery (Soekarwo, 2018). During 1986–1987, the Ministry of Public Works endowed the Umbulan Drinking Water Project with a \$120 million soft loan from Japan's Overseas Economic Cooperation Fund (Kurniawan, 2020). However, the partnership was dissolved because of a change to the implementation plan involving private participation. The difficulties in advancing the tender proposal through private participation persisted until 1999.

During 2000–2010, Bappenas and the Ministry of Public Works and Housing conducted a study on a procurement scheme for the Umbulan SPAM, with the provincial government wanting the Indonesia Infrastructure Initiative to be the project manager. In 2011, the Umbulan SPAM was established as a PPP per Presidential Decree No. 67/2005, while the provincial government conducted the prequalification of business entities, approving five consortiums. In 2012, it continued the tendering process by releasing initial bid documents,

followed by two amendments to the documents in 2012 and 2013, before conducting multiple consultations with each consortium. Yet the auction process was unable to proceed as the viability gap funding (VGF) was not approved. The Umbulan SPAM ground-breaking and construction process started in 2017 and were expected to be completed within 2 years. Finally, in 2021, Umbulan SPAM construction was completed, installing safe, clean water access for 320,000 homes (Bappenas, 2022).

Under the PPP financing plan, the provincial government acts as the responsible party, and the central government oversees the build–operate–transfer contract procedure for private sector firms to build Umbulan SPAM's main distribution network, while local drinking water corporations manage the secondary and tertiary water distribution infrastructure.

The Umbulan SPAM project had capital expenditures of Rp2.39 trillion, supported by a Viability Gap Funding (VGF) of Rp818 million and insured by PT Penjaminan Infrastruktur Indonesia (PII) (Ministry of Finance, 2023). In addition, PT Indonesia Infrastruktur Finance (IIF) and PT Sarana Multi Infrastuktur (SMI) signed an Rp840 billion SPAM Umbulan arranged financing agreement that will speed up project completion (SMI, 2023). The duration of the construction phase for this project spans a period of three years, while the concession period extends for a duration of twenty-five years and nine months. The return on investment is realized through user payments. With a capacity of 4,000 literes per second, the project will provide water from the Umbulan spring to an estimated 1,300,000 households in five districts/cities of East Java.

The PPP approach utilised in Umbulan SPAM resolved the following issues: (i) land acquisition increasing after the completion of the detailed engineering design, (ii) community disapproval and social conflict, (iii) problematic spatial licensing, (iv) inflated water distribution costs due to toll-road pipe land rental, and (v) pre-operation electricity costs.

Meanwhile, several lessons learned from Umbulan SPAM include successfully utilising a PPP scheme for financing urban water management activities; obtaining local government before executing the urban infrastructure project to avoid underutilisation and lower economic visibility; and understanding that not all local governments and local drinking water firms will provide secondary and tertiary pipe networks to optimise water distribution.

Source: Author's compilation except where referenced. Ministry of Finance, 2023 and SMI, 2023.

There are further opportunities to augment the effectiveness of the PSN. First, government commitment consistency should be enhanced, including financial backing. Second, knowledge management and knowledge transfer should be boosted in creating more effective and efficient PSN projects. This includes helping bolster the decisiveness of the government contracting agents and the readiness of the technical team. Third, long-term financing options should be expanded to provide more opportunities for infrastructure investment. Last, local political dynamics should be mitigated to pave the way for smoother project implementation.

5. Conclusions

High-quality infrastructure is crucial for economic development. However, providing infrastructure is often challenging due to its complex and dynamic nature. It involves multiple stakeholders with varying interests, expectations, and capacities, creating additional barriers and requiring careful planning, coordination, and execution. Like other countries that must invest in their infrastructure sector to fully reap the benefits of economic development, Indonesia faces challenges in providing adequate infrastructure, particularly since the 1997 AFC. Traditional issues like land acquisition, intergovernmental coordination, and regulatory constraints arise during project implementation, in addition to the struggle to find sustainable sources to finance the infrastructure development.

In response to formidable challenges, Indonesia has initiated a strategic policy under the Widodo Administration known as the PSN, serving as a catalyst for accelerating infrastructure development. This includes prioritising physical infrastructure initiatives such as road connectivity, electricity, housing, and water and sanitation, which are given heightened importance compared to other sectors.

Learning from completed PPP-based projects, the success of PPP framework, the success of PPP implementation depends on the following factors: (i) alignment of PPP objectives with national development priorities and public interest; (ii) availability and affordability of long-term financing and risk-sharing instruments; (iii) capacity and transparency of public institutions in terms of supporting regulatory reforms the PPPs; and (iv) engagement and participation of stakeholders, especially local communities and civil society organisations.

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Appendix

Appendix 3.1. Government Supports for PSN PPP Projects (Data as per September, 2022)

No.	Project Name	Value (Rp)	Government Support	Status
1	High Throughput Satellite	6.42 trillion	IIGF Guarantee, AP	Construction
2	West Palapa Ring ICT Backbone	1.2 trillion	PDF, IIGF Guarantee, AP	Operation
3	Central Palapa Ring ICT Backbone	1.1 trillion	PDF, IIGF Guarantee, AP	Operation
4	East Palapa Ring ICT Backbone	5.1 trillion	PDF, IIGF Guarantee, AP	Operation
5	Krian–Legundi–Bunder–Manyar Toll Road	12.9 trillion	IIGF-MOF Guarantee	Partial COD
6	Serang–Panimbang Toll Road	8.6 trillion	IIGF-MOF Guarantee	Partial COD
7	Cileunyi–Sumedang–Dawuan Toll Road	8.4 trillion	IIGF-MOF Guarantee	Partial COD
8	Probolinggo–Banyuwangi Toll Road	23.4 trillion	IIGF-MOF Guarantee	Construction
9	Jakarta Cikampek II Selatan Toll Road	14.7 trillion	IIGF-MOF Guarantee	Construction
10	Manado–Bitung Toll Road	4.9 trillion	IIGF Guarantee	Operation
11	Semarang–Demak Toll Road	5.4 trillion	IIGF Guarantee	Construction
12	Balikpapan–Samarinda Toll Road	11.9 trillion	IIGF Guarantee	Operation
13	Komodo–Labuan Bajo Airport	1.2 trillion	IIGF Guarantee	Pre-FC
14	East Java's Umbulan WSS	2.1 trillion	PDF, VGF, IIGF Guarantee	Operation
15	Bandar Lampung WSS	750 million	PDF, VGF, IIGF Guarantee	Operation
16	West Semarang WSS	417 million	PDF, IIGF Guarantee	Operation
17	Jogjakarta's Kamijoro Regional WSS	437 million	PDF, VGF, IIGF Guarantee	Preparation
18	Central Java's Wosusokas Phase II Regional WSS	919 million	PDF, VGF, IIGF Guarantee	Preparation
19	Metropolitan Cirebon (Jatigede) Regional WSS	3.39 trillion	PDF, VGF, IIGF Guarantee	Preparation

No.	Project Name	Value (Rp)	Government Support	Status
20	Makassar–Parepare Railway	989 million	PDF, IIGF Guarantee, AP	Construction
21	Papua's Teluk Bintuni Industrial Estate	1.73 trillion	PDF, IIGF Guarantee	Preparation
22	West Java's Legok Nangka Regional Waste Management	4.05 trillion	PDF, VGF, IIGF Guarantee	Transaction
23	South Tangerang Waste Management	1.8 trillion	PDF, IIGF Guarantee	Preparation*
24	Semarang's Jatibarang Waste Management	2.8 trillion	PDF, IIGF Guarantee	Preparation*
25	New Ambon Port	4.5 trillion	PDF	Planning
26	Integrated Palapa Ring ICT Backbone	7.7 trillion	AP, IIGF Guarantee	Planning
27	Java's Callender Hamilton Bridges	2.2 trillion	AP, IIGF Guarantee	Construction
28	Gas Housing Distribution Network in Batam	2.37 trillion	PDF, IIGF Guarantee	Preparation
29	Gas Housing Distribution Network in Palembang	3.2 trillion	PDF, IIGF Guarantee	Preparation

AP = availability payment, COD = Commercial Operations, FC = Financial Closure, ICT = information and communications technology, IIGF = Indonesia Infrastructure Guarantee Fund, MOF = Ministry of Finance, PDF = project development facility, VGF = viability gap financing, WSS = water supply system.

* PDF Facility has ended.

Source: MOF.