



Chapter 9

Lessons Learnt Regarding Infrastructure Development in Indonesia

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1. Infrastructure Development and Inclusive Economic Growth

Infrastructure has always been perceived as a critical factor in ensuring the quality of development. Its impacts range from lower prices, equality amongst regions, to higher frequency of mobility. Infrastructure also plays a significant role in alleviating poverty and reducing inequality. In short, it presents both short- and long-term benefits by helping foster productivity and promote improved living standards.

For Indonesia, the development of adequate infrastructure is an essential aspect in determining the welfare of its regions. The existence of infrastructure – such as roads, ports, and electricity access – will support interconnectivity across its provinces and therefore determine the preconditions to achieve higher and inclusive economic growth. In addition, physical infrastructure is needed to support the country's pattern of urbanisation, which is primarily triggered by its growing population.

Chapter 1 showed that the successive governments have put forth solid efforts into accelerating the development of infrastructure in Indonesia. President Susilo Bambang Yudhoyono, who governed 2005–2014, introduced several initiatives to boost development progress. President Joko Widodo, who has governed since 2014, is emphasising infrastructure development as one of nine priority development programmes known as *Nawacita*, which were translated into the *Rencana Pembangunan Jangka Menengah Nasional (National Midterm Development Plan, RPJMN)*, 2015–2019. Joko Widodo's government also established a priority programme for infrastructure delivery – *Proyek Strategis Nasional (PSN)* – and allocated large amounts of the State Budget to infrastructure. To de-bottleneck coordination problems, it established the *Komite Percepatan Penyediaan Infrastruktur Prioritas (Committee for the Acceleration of Priority Infrastructure Delivery, KPPIP)* in 2014, which is equipped with stronger authority, including providing incentives for projects. The PSN is under KPPIP authority.

In addressing overlapping issues and asynchronous regulations on infrastructure development (including PPPs), the government issued Presidential Regulation No. 3 of 2016 concerning acceleration of the implementation of the PSN – it was focussed on meeting basic needs, improving people's welfare, and prioritising job creation. The regulation has been amended three times to accelerate regional infrastructure development further. PSN projects are thus receiving facilities such as 0% tariffs for land and building right acquisition fees. Furthermore, to facilitate the PSN, the government also created Regulation No. 42 of 2021 as in Chapter 3.

Massive infrastructure provision comes with enormous investment needs. Based on KPIIP (2022), 153 PSN projects have been completed, with estimated investment financing of Rp1,040 trillion from 2016 until mid-2022. However, this amount is comparatively small compared to the total financing planned until 2024. As stated in the RPJMN, 2020–2024, the need for national infrastructure investment will reach Rp6,445 trillion – equivalent to around 11% of the annual GDP, 68% of annual realised national government spending, and 29% of total financial assets (Chapter 4).

The inability to fulfil the investment needs for the infrastructure development agenda through the State Budget and traditional private financing schemes has made Indonesia look towards innovative financing. PPP regulations were amended in 2015 to foster an implementation framework and to facilitate the need for government support to address private investors' concerns about project viability and bankability. As part of the regulatory framework, the Ministry of Finance undertook several innovative programmes to enhance infrastructure financing, such as the Project Development Facility, viability gap funding, and guarantees.

Chapter 5 estimated that the PSN has contributed to a total economic output of Rp1,799 trillion, generating economic value added of Rp805.20 trillion and total household income of Rp319.51 trillion. Additionally, around 4.9 million employment opportunities were created over the same period. In 2022, the economic value added and job opportunities associated with the PSN accounted for 0.21% and 0.17% of Indonesia's GDP and national workforce, respectively. Certain provinces, such as North Sumatra and West Kalimantan, exhibited high multiplier values, indicating substantial economic impacts. Economic and industrial zones, bridges and roads, and electric power sectors demonstrated the greatest economic and labour impacts compared to other sectors.

Given that the PSN consists of many different projects, it renders a comprehensive and holistic evaluation unfeasible. Chapter 6 provided a few case studies to show the socio-economic impact of PSN. An empirical investigation of the aggregate socio-economic impact of toll roads observed a positive impact on the improvement of broader aggregate-level socio-economic indicators. On average, sub-national economic growth accelerated in regions traversed by a PSN toll road; in addition, poverty incidence declined, and income distribution improved, albeit modestly.

For PSN clean water projects, drawing an inference from household-level data and several selected project technical documents, the ex-post evaluation found that household access to piped water is improving, particularly for households in the lowest income decile in the area served by the water projects. However, challenges remain, particularly in capacity optimisation and maintaining the quality of services. As the last-mile deliverers of piped water, local governments are struggling to secure adequate post-construction operational funding to install pipelines from

water treatment facilities to end-users. The fact that tariffs are not set solely on economic and financial considerations exacerbates the issue. The lack of adequate operational funding has also led to lacklustre service coverage increases and less-than-ideal service disruption management. This finding highlights the importance of coordination between the central and local governments on the construction of PSN projects as well as on project operation after completion. This is particularly important for basic infrastructure projects where, in most cases, the local government has a significant role in handling operational technicalities.

Chapter 6 also showed that the Widodo Administration has managed to leverage limited direct public spending to improve socio-economic outcomes by prioritising State Budget contributions for projects with high socio-economic impact but limited financial feasibility. Nonetheless, State Budget contributions for financially feasible projects are still quite substantial. While the State Budget contributions are expected, the sizeable number of projects receiving contributions indicates that there is room to invite the private sector to better leverage the direct contribution of public spending and to avoid the crowding out of private investment in otherwise financially viable projects.

The implementation of the PSN at the regional level varies. Chapter 7's case study of the Bitung Industrial Special Economic Zone demonstrated that land acquisition disputes remain and must be settled by the government – especially the provincial land agency – as the PSN project traverses three local government administrations in North Sulawesi. Land acquisition issues also hinder the progress of the special economic zone development as the private sector is still taking a wait-and-see approach to investing, despite facilities provided by the mayor to ease doing business in the city. Indeed, the strong commitment of the local government to the PSN project has been a key success factor of the West Semarang Water Supply Project. Chapter 7 indicated that the commitment of the mayor of Semarang occurred both through policy and regulation, as well as through a financial commitment for land acquisition and involvement of a city-owned enterprise to run the project.

These two above case studies showed that a project that provides basic needs for citizens – such as the water supply project – may receive more substantial commitments from local governments than one that promotes economic growth. In addition, a project that involves fewer land parcels to acquire seemed to be more successful than one that involves many land parcels, such as a transport network project.

To overcome regional disparity, integrated regional development is key, considering economic diversification, commodity downstreaming, development linkages, and human resources development. Local government commitment and its capacity are crucial as are stakeholder coordination and innovative financing schemes, including PPPs. Specialised institutions – like PT SMI and PT PII – are vital in facilitating infrastructure financing.

Looking to the future, climate change and environmental elements are important to consider. Adaptation and mitigation of climate change entail efforts to adapt to current or anticipated future climate conditions, reduce negative impacts, and maximise potential benefits. Creating infrastructure that is climate-resilient attempts to reduce vulnerability to climatic change and unpredictability, thereby mitigating their negative effects. The costs associated with adaptation are complex, but they represent only 3% of total investment requirements.

Infrastructure is also an integral component of emissions reduction initiatives. Infrastructure assets invulnerable to disasters are advantageous because they reduce greenhouse gas emissions and environmental costs. To demonstrate the importance of green and resilient infrastructure, however, the quantification of these intangible benefits and the various cost and benefit domains must be addressed.

As discussed in Chapter 8, the estimated funds required to achieve Indonesia's emissions reduction goal equal about Rp300 trillion per year (MEF, 2021), which is a sum that the State Budget cannot afford. Indonesia continues to encounter obstacles that impede private sector involvement in infrastructure development, however, including green infrastructure. To address this, KPPIP is working to facilitate the process of selecting, preparing, directing, and managing projects as well as providing fiscal and non-financial support, particularly for the PSN. In addition, to finance climate-adaptive infrastructure, Indonesia has issued green *sukuk*, government-issued sustainable bonds. By the end of 2020, the government owned \$3.1 billion of \$5.0 billion in outstanding green bonds.

Blended finance schemes are another alternative for bridging the funding deficit. This plan brings together funds from international organisations, development agencies, the private sector, charitable foundations, and other public sources. It requires a healthy ecosystem and a substantial market size for mitigation and adaptation measures. In addition, Indonesia has access to Green Climate Fund and Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+) financing; Indonesia has been allocated \$476.9 million, including \$103.8 million in REDD+ results-based payments for its efforts during 2014-2016. Chapter 8 suggested that to promote the development of climate-resilient infrastructure, Indonesia should create incentives for key stakeholders to participate in collective financing, expand the financial market through regional and global cooperation, and integrate climate considerations into sub-national infrastructure. This requires comprehensive technical guidance and capacity development, with an initial emphasis on critical sectors including transport, energy, land-use change, and forestry, to encourage the active participation of local governments.

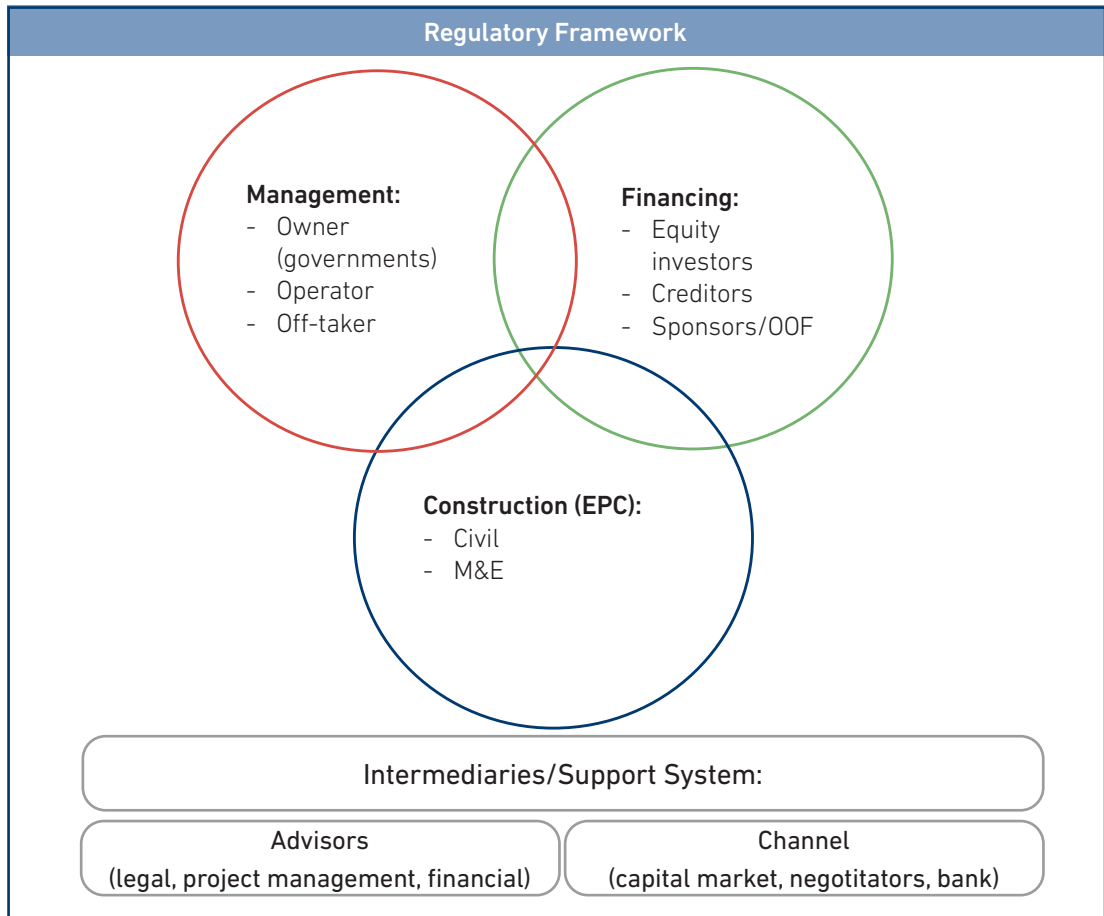
2. Future Infrastructure Development

Indonesia required more than 2 decades to reach its current status – from a deficit to an excess in electricity, from poor road connectivity to a more connected Indonesia (with additional ports connecting Indonesia's water and air transport), and better accessibility to clean water and sanitation. Telecommunications and internet infrastructure were accelerated during the COVID-19 pandemic, assisting Indonesia in mitigating the pandemic's negative effects. Satellites and an increase in mobile-based transceiver stations have made working and studying from home feasible – even for residents in remote areas.

To encourage more private investment in infrastructure to fill the remaining infrastructure financing gap, it is necessary to enhance regulatory and institutional frameworks and human capital to manage the process. From the successful implementation of the PSN through PPPs, it is essential to learn about the availability and affordability of long-term financing and risk-sharing instruments, as well as the capacity and transparency of public institutions to support regulatory reforms to design, purchase, monitor, and evaluate PPP projects. The next government needs to invest more in economically viable but financially unfeasible projects to make them attractive for private investors to participate. Additionally, private investors should be encouraged to invest in commercially viable infrastructure projects to nurture the infrastructure ecosystem through better risk adjusted scheme.

PPPs require wholesome, interconnected, and well-planned interactions amongst stakeholders. Governments, financiers, construction firms, project management and advisory services, off-takers, and facilitators/channels are the key stakeholders (Figure 9.1).

Figure 9.1. Infrastructure Ecosystem



EPC = engineering procurement construction, M&E = mechanical and electrical, OOF = other official flows.
Source: Zen (2019).

The government plays a dual role as both a project's regulator and owner. As a regulator, it drafts and issues necessary regulations and develops the infrastructure development system, which dictates the fundamentals of the entire ecosystem. Infrastructure development is fostered by a regulatory framework that encourages other actors' healthy and active participation. It includes fiscal and other support, facilitation, fair competition, and inclusive principles. It allows financial institutions, construction companies, and advisors to participate to a greater extent. The importance of the off-takers – who may be institutions or individuals – is not diminished as they determine project sustainability. Their participation from the beginning of the project plan is required.

Given the remaining infrastructure gap, with the active role of central government to provide infrastructure and stimulate private participation in infrastructure provision, higher local government participation, particularly in accelerating local infrastructure development, is needed for filling the gap sooner. The established infrastructure financing special vehicles such as PT SMI, PT PII and IIF should expand their work to local government. With improved capacity in project development and execution at local level, including developing risk-adjusted investment scheme to better attract investors to local infrastructure, much more projects can be executed at the same time.

Future objectives for a prosperous and more equitable Indonesia necessitate infrastructure that is not only adequate but also appropriate. Infrastructure plays a crucial role in adapting to and mitigating the threats posed by climate change, which are intensifying. Yet Indonesia, like many other developing economies, faces limited resources, including an inadequate budget for climate adaptation efforts. While the international community demands a more substantial contribution from developed economies, Indonesia can also improve its domestic strategy. Aside from constructing fundamental climate-adjustment infrastructure, Indonesia can adapt climate-resilient infrastructure management earlier to achieve more efficiency. Technology that improves analytical functionality, data management, connectivity, and automation in infrastructure construction and operation offers substantial economic benefits – the same holds for adaptability in management.

Sector-wise, energy is a major contributor to greenhouse gas emissions, while transport is a major player in the energy sector. Transport infrastructure is, therefore, essential for adaptation and mitigation efforts. Transport infrastructure such as roads, railways, airports, and seaports can be constructed for climate-resilient compliance and energy conservation. With structural adaptations, such as integrating technology into infrastructure, additional benefits, such as increased durability, green infrastructure, and a circular economy, can be realised. In addition, embracing adaptation management can enhance protection, reduce greenhouse gas emissions, and foster adaptation skills.

Meeting the future demands of essential human activities is another way of referring to adequate infrastructure. Advanced economies expect to enter Industry 5.0 (e.g. the European Union) or Society 5.0 (e.g. Japan) following Industry 4.0. This era will be distinguished by the emergence of a new phase of industrialisation in which humans collaborate with advanced technology and artificial intelligence, necessitating more sophisticated infrastructure characterised by being sustainable, resilient, cloud-based, and user-centric.

Demand levels and future infrastructure adoption will vary between developed and developing economies. Developing economies are responsible for determining their own paths and the types of infrastructure required to support them. The infrastructure of Indonesia must be resilient and sustainable. Due to the abundance of fossil energy sources in Indonesia, carbon capture can be utilised to maintain carbon neutrality. Forests and oceans must be carefully maintained to absorb greenhouse gases, produce clean air, and serve as sustainable economic resources, including for the blue economy.

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