

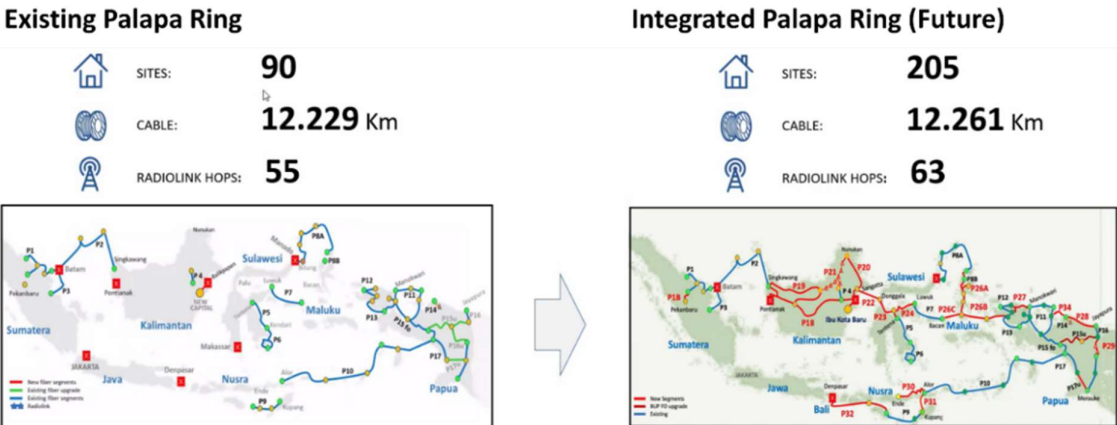
S3: Appendix C - Palapa Ring Project as the National Infrastructure Policy

Initially, we wish to emphasize that before the release of government rule No. 46 of 2021, the operator's market leader was the exclusive network supplier for fiber optic infrastructure. A monopoly on territory by the incumbent exists when new entrants of cellular services are unable to roll out their services because network providers do not wish to rent out their networks, even if they do so at prohibitively high / unjustifiable costs. With the open access policy facilitating the telecoms infrastructure, it is anticipated that the equal distribution of telecommunications access will accelerate. Table S1 shows existing backbone layer (optical fiber).

Table S1. Optical Fiber Network as Backbone [31]

Operator	Inland [km]	Marine [km]	Total [km]	Bit Rate [Gbps]
Telecommunication Operator	220.297	109.713	330.010	N/A
Non-Operator/Palapa Ring	sub total	sub total	sub total	sub total
BAKTI:	4.156	8.073	12.229	1.404
• West Package	404	1.720	2.124	300
• Central Package	1.304	1.798	3.102	600
• East Package	2.448	4.555	7.003	504
Grand Total	224.453	117.786	342.239	more than 1.404

The incumbent's approach is to make its network available for leasing after the internal demands of its holding company have been addressed. If capacity is unavailable because it is already filled, reserved for services in the larger public interest, or the opening of access is not technically practicable, the responsibility to open access is nullified. Moreover, as depicted in Figure C1, the government, through the Telecommunication and Information Accessibility Agency (BAKTI), held an optical fiber network known as the Palapa Ring to provide access in non-commercial areas. The Integrated Palapa Ring will connect all Indonesian regencies as shown in Figure S9.



In 2019, the Palapa Ring Fiber Optic Telecommunications Network was constructed, connecting 90 regencies/cities throughout Indonesia, with proposed 57 service regencies/cities and 33 interconnection regencies/cities completed [32]. Through mobile phone/cellular/mobile networks, the benefits of this communications infrastructure can be realized. Furthermore, the Indonesian government has designated 13 cities for 5G pilot projects via the Strategic Plan of the Ministry of Communication and Information (KOMINFO). This plan includes one state capital (IKN); six provincial capitals on the island of Java (Banten: Serang, DKI Jakarta: Jakarta, West Java: Bandung, Central Java: Semarang, DIY: Yogyakarta, East Java: Surabaya); five super-priority tourism destinations, including Lake Toba, Likupang, Borobudur, Mandalika, and Labuan Bajo); and one manufacturing/industrial region. This 5G plan is being implemented through various efforts, such as regulation of infrastructure-sharing policies, simplification of operating licensing, the provision of tax incentives, and support for business investment implementation of 5G networks.

The results of this study may be applied to 5G deployment in the 3.5 GHz band, where government initiatives are encouraging deployment starting in districts that are considered feasible both in terms of market potential and infrastructure support.

REFERENCES

- [31] Socialization of Palapa Ring Integration - Efforts To Accelerate Digital Transformation (in the original language (Bahasa): "Sosialisasi Palapa Ring Integrasi - Upaya Percepatan Transformasi Digital"). BAKTI KOMINFO: Jakarta, Indonesia, 2022.
- [32] "PALAPA RING Broadband in 57 Regencies/Cities through the Pattern of Government Cooperation with Business Entities in Infrastructure Provision (PPP) (in the original language (Bahasa): "PALAPA RING Broadband di 57 Kabupaten/Kota melalui Pola Kerjasama Pemerintah dengan Badan Usaha dalam Penyediaan Infrastruktur (KPBU)"". BAKTI KOMINFO: Jakarta, Indonesia, 2021. Available online: https://www.baktikominfo.id/assets/uploads/ar_palapa_ring_sept_2021-min.pdf (accessed on 8 April 2022).