ABSTRACT

As the biggest archipelagic country in the world, Indonesia has a problem with the distribution of its network infrastructure to provide broadband access across the regions. At the same time, it is very important to provide broadband access in the digital era because Indonesia's capacity needs to access the data are growing rapidly, time by time. It will take a lot of time and effort if Indonesia only depends on the terrestrial network infrastructure to fulfill its needs. Another way to provide broadband access is through the newest technology of space network infrastructure, commonly known as High Throughput Satellite (HTS). HTS implementation can help Indonesia achieve broadband access more evenly in its Regions, which are still not covered by terrestrial network infrastructure.

This research assessed the HTS implementation of the Indonesian Government case study for the multifunctional services, using the techno-economic and regulatory analysis. The research was conducted by comparing two potential frequency bands for HTS in Indonesia: Ku and Ka-Band, from technical, economic, and regulation perspectives, which were discussed comprehensively. The technical analysis was conducted through coverage analysis and capacity analysis of HTS. The economic analysis was assessed the CAPEX-OPEX analysis, business feasibility analysis, and sensitivity analysis using the technical analysis result, related assumption, and related HTS information data. The regulatory analysis was conducted by analyzing an existing regulatory instrument to find out whether the regulations are still relevant or not. Then, the recommendation regarding the regulation was also proposed if the regulation needs to be changed.

As a result, the technical analysis showed the trade-off between HTS operates in Ku and Ka-Band. The Ka-Band HTS needed more power to build the link connection than Ku-band HTS to overcome the attenuation, fading, and noise. However, the Ka-Band HTS was potentially able to provide more throughput than Ku-band HTS. The economic analysis showed that both Ku and Ka-Band HTS using this case study could be known as an acceptable project according to the CAPEX-OPEX analysis and business feasibility analysis. The business feasibility analysis for both HTS are as follows: NPVs are positive, IRRs are greater than the WACC+ margin of 5%, PIs are greater than 1, and both payback periods are achieved before the HTS end of life. The sensitivity analysis result showed that the four most influential variables for both HTS are Lending Interest, Cost of Equity, User Throughput Allocation, and ARPU. The regulatory analysis result showed that there was needed a change in some regulatory instruments: ITU Radio Regulation, MCI Regulation No. 13/2018, Draft of the MCI Regulation 2021, Government Regulation of the Republic of Indonesia No. 80/2015, MCI Regulation No. 24/2010, MCI Regulation No. 21/2014, and Government Regulation of the Republic of Indonesia No. 52/2000.

Keywords: High Throughput Satellite, Government Multifunctional Services, Frequency Spectrum, Techno-Economic, Regulatory Analysis.