

ABSTRACT

The government through the Ministry of Communication and Information is making various efforts to realize digital sovereignty throughout Indonesia. One of them is the construction of Indonesia's first High Throughput Satellite (HTS). Satellites with high throughput are the latest solution to provide service access in areas that need telecommunications services. In general, this type of satellite uses frequency bands in the Ku-band and Ka-band which in various studies have been shown to produce higher throughput. Indonesia does not have regulations that specifically regulate high throughput satellites regarding the frequency spectrum and the rules for implementing the new technology. Therefore, through this paper, research will be carried out with a comparative analysis technique that compares Ku-band and Ka-band in determining an efficient frequency band for HTS in Indonesia, comparisons are carried out on the technical side, that is comparing the throughput that can be achieved by the frequency band. After analyzing the frequency bands to be used, the next step is to review the existing regulations regarding satellites in Indonesia to ensure that these rules are still relevant in regulating HTS satellites or require updates in certain rules.

The results of this study show that Ku-band and Ka-band can be used for HTS satellites in Indonesia. All communication links tested showed C/N values higher than the minimum requirements of C / N. Although both frequency bands can use in Indonesia, in terms of economy and efficiency, Ka-band is greater than Ku-band, the availability of wide bandwidth makes the throughput produced by Ka-band more than Ku-band. Capacity measurement simulation is also carried out with two frequency reuse schemes where higher throughput is present at 8 spot beams per cluster scheme. The scenario requires at least nine times frequency reuse to cover the entire region of Indonesia with total throughput on Ka-band 123.02Gbps under normal sky conditions and 55.56Gbps under rain sky conditions. The regulation review process resulted in suggestions for changes to the bandwidth cost index to be used in setting spectrum prices for the use of HTS. The need for this change is based on the consideration that HTS satellites are sensitive bandwidth technology, and the use of previous cost index indices will cause very high prices.

Kata kunci : Satelit, *High Throughput Satellite*, Ku-band, Ka-band Spectrum, Frequency Reuse