

## ABSTRACT

Nowadays, the quality of communication is improved, especially in side of data service. A kind of technology that fulfills data service with high data rate is UMTS (Universal Mobile Telecommunication Service). UMTS has data rate up to 2 Mbps. However, UMTS has only coverage area about 1-2 km in terrestrial system. This system is able to be built macro cell with wider area by using HAPS. HAPS is operated in altitude 5-22 km from the sea surface or stratosphere zone. HAPS can be used as coexistence network with terrestrial network for emergency situation like in disaster case. Bandung Barat Regency is also critical tendency os disaster area. So, it is urgent to make a planning of UMTS network using HAPS before be implemented.

Planning methods of UMTS that using HAPS in this thesis are planning base on coverage and planning base on capacity that simulated using Atoll 2.8.1 software. Then determination of radius cell is base on coverage uses propagation model Free Space Loss. The design is principle on the capacity with purpose to know the average throughput value of cell is available use Offered Bit Quantity (OBQ).

The parameters used in this simulation and analysis are signal level,  $E_c/I_o$ , throughput dan overlapping zone. Based on planning, the result of coverage planning with altitude 17 km at longitude 107.336804E and latitude 6.958623S, these are four cells to cover Bandung Barat Regency. The result datas are 44.7% area covered by signal level above -98 dBm, 96.2% area covered by UMTS service, 66% are covered by  $E_c/I_o$  above -16 dB, overlapping zone 9%, and network throughput downlink 2.67 Mbps and throughput uplink 1.58 Mbps.

Keywords: UMTS, HAPS, Coverage Planning, Capacity Planning, Signal level,  $E_c/I_o$ , Overlapping Zone, throughput