

Utilization of Geospatial Technology in Mangrove Conservation and Blue Carbon Initiative to Support Innovative Funding for the Development of Kota Baru Sofifi, North Maluku

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Abstract- Indonesia plays an important role in mitigating climate change by storing carbon in the form of mangrove biomass as a country with the largest mangrove forest area in the world, which equivalent to 22.4% of the total global mangrove forest. Mangrove forest is found in Sofifi, the capital of North Maluku Province, one of the four cities included in New City Major Project in Indonesia's Medium-Term Development Plan (RPJMN) 2020-2024. The discussions on acceleration of the city development have prioritized selected development activities to be implemented in 2023-2024, one of which is the development of Guraping Mangrove Forest (GMF) as one of tourist attractions and economic drivers in the city. Due to its very strategic function, it is necessary to evaluate the biomass and carbon stored in the GMF which not only contributes to the protection of coastal areas, but can also be utilized in the ongoing construction and development of Sofifi with innovative funding through blue carbon initiative. The delineation of mangrove forests in this study was obtained using the Landsat 8 OLI Satellite and SRTM through supervised classification on the GEE platform. Meanwhile, the biomass and carbon of mangrove forests are estimated through NDVI modeling which is then processed using Above Ground Biomass (AGB) and Above Ground Carbon (AGC). The results of the Landsat 8 OLI delineation in 2020 show the area of the GMF is 145.37 hectares and based on the model used, the total AGB and AGC of the GMF are estimated to be approximately 739,738.87 tons and 347,676.82 tons. The amount of biomass is equivalent to 8,769.45 tons of CO₂ absorbed or in the carbon market values at US\$96,463.95 (Rp.1.5 billion). The potential carbon stock contained



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in the GMF can be utilized as innovative funding through blue carbon initiatives to support the Sofifi development.

Keywords- Above Ground Biomass, Blue Carbon Initiative, Carbon Stock, Geospatial Technology, Mangrove Ecosystem.