

Optimization of Land and Building Tax Absorption Through 3-Dimensional Modeling and Digital Twin Visualization from Aerial Photo Survey

Authors : S. Riadi, T. Hariyanto, A. Bawasir, M. Prabandaru, S. C. Navisa

Abstract : The era of digitalization and the advancement of information technology for mapping and modeling three-dimensional (3D) space has become an important factor in various sectors, including in land and building management. In Indonesia, the potential for utilizing 3D mapping technology can be used to optimize the absorption of Land and Building Tax (PBB) which is still not optimal. This is caused by various factors, one of which is the lack of accurate and comprehensive mapping. Aerial photo mapping is the main technology often used in 3D GIS (Geographic Information System) modeling. Visualization of the results of 3D modeling and digital twins in Kelurahan Jawa, Samarinda is modeled as an interactive tool for policy makers to improve operational efficiency in property tax management. The results of this study reveal how the geodatabase is compiled, the creation of 3D multipatch from oblique aerial photo acquisition to digital twin visualization with CE90 accuracy of 0.133 m and LE90 of 0.712 m. In addition, the quality of this accurate digital twin is indicated by mean difference 0.473 m and RMSE value of the building height of 0.561 m. The results of the photogrammetry method compared to BAPENDA data on an area of 92 Ha have a mean difference in building area of 73.98 m² and a total area difference of 114,747 m². Finally, this study was able to optimize regional income related to land and building tax from IDR 949,962,806 to IDR 1,112,471,515. This was able to optimize land and building tax in order to increase regional income by IDR 162,508,709 or 17.10%. This study clearly has a significant financial impact on the local government.

Keywords : digital twin, land and building tax, 3d mapping, photogrammetry

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