

Mapping Model for Identifying Village Potential to Support the SDGs Program in the Field of Village Infrastructure

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Abstract

Bali has undergone numerous evaluations regarding the absorption of SDGs programs. However, these efforts are often hampered when it comes to program enhancement and development due to the lack of accurate and up-to-date data on village potential. This is especially true for Pasedahan Village, the focus of this study, which spans an area of 0.61 km². Despite its small size, Pasedahan has considerable potential due to its close proximity to the well-known tourism village of Tenganan. The use of photogrammetry-based methods is considered highly effective and efficient for spatial planning and mapping purposes. This research provides a strategic solution for the local government of Pasedahan Village in realizing future SDGs programs. The primary outcomes include a base map and a comprehensive map of the village's potential, which will significantly support the village administration in addressing data-related challenges in achieving SDG targets. The process began with the dissemination of QGIS mapping results among village officials and community leaders. This was followed by a Focus Group Discussion (FGD) aimed at formulating an infrastructure work plan and improving the baseline infrastructure-related SDG score. The method for calculating the percentage increase in SDG achievement—based on specific goals and indicators—consists of several stages: identifying goals and targets, selecting relevant indicators, collecting data, analyzing data, and calculating progress. Based on the 2024 results, the SDG program achievement rate in the village stood at 65.57%. Subsequent infrastructure improvements and supplementary activities contributed an additional 25.61%, leading to a projected overall achievement rate of 91.18% by the year 2026.

Keywords

Model, Mapping, QGIS Method, SDGs Program, Village Infrastructure

Biographies

I Kadek Suyasa is a graduate of the Master of Infrastructure and Environmental Engineering Program at Warmadewa University, Denpasar, Bali, Indonesia. His academic and research interests focus on sustainable infrastructure development, village spatial planning, and the integration of geospatial technology in regional development. As a dedicated researcher, Suyasa has contributed significantly to the study and implementation of the Sustainable Development Goals (SDGs) at the village level, particularly in rural areas of Bali. One of his notable research projects involved the development of a mapping model to identify village potential in support of infrastructure-based SDGs programs. This study, conducted in Pasedahan Village, emphasized the use of photogrammetry and QGIS-based mapping to generate accurate and up-to-date data essential for spatial planning and infrastructure improvement.

Through his work, Suyasa has demonstrated a strong commitment to empowering local governments with data-driven solutions. His research has not only provided practical tools—such as base maps and potential maps—but has also laid the groundwork for policy formulation and community participation in infrastructure development. By applying participatory methods such as focus group discussions (FGDs), he has facilitated collaborative planning between village officials and community leaders to boost SDG achievement.

Putu Aryastana is a dedicated lecturer and researcher at the Department of Civil Engineering, Warmadewa University, Denpasar, Bali, Indonesia. His academic journey reflects a strong commitment to advancing interdisciplinary knowledge in the fields of infrastructure, water resources, and environmental sustainability. His scholarly work has been published in reputable journals and conference proceedings, with notable recognition for his study on the validation of satellite precipitation data over Bali Island, which has been widely cited and applied in environmental monitoring efforts. Aryastana integrates advanced geospatial technologies and modeling methods to support sustainable urban and regional planning in Indonesia. As a lecturer, his passion lies not only in research but also in shaping future engineers and environmental scientists who are capable of addressing the complex challenges faced by Indonesia's rapidly developing regions.

Putu Ika Wahyuni is a lecturer in the Master of Infrastructure and Environmental Engineering program at Warmadewa University, Indonesia focusing on construction management and environmental studies. She has several important works and publications, including “A Study of Rainfall Thresholds for Landslides in Badung Regency Using Satellite-Derived Rainfall Grid Datasets,” published in the International Journal of Advances in Applied Sciences. Additionally, she authored “Risk Analysis on the Use of Heavy Equipment with the HIRARC Method,” included in the AIP Conference Proceedings, as well as “Performance of High-Resolution Satellite Rainfall Datasets in Developing Rainfall-Duration Thresholds for Landslide Incidents Over Badung Regency,” published in the IOP Conference Series: Earth and Environmental Science. With her extensive experience and research, Putu Ika Wahyuni significantly contributes to the advancement of knowledge in the fields of construction and the environment.