Hybrid Surveying for Indian Architecture and Environmental Analysis: Bridging the Workflow Gap

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The study addresses a key gap in Indian architectural and environmental practice: the lack of a standardized workflow for integrating traditional ground surveying with drone based photogrammetry. Lack of such integration in a workflow limits the efficiency and quality of site's data collection, environmental analysis and design coordination. The research is intended to develop and assess a practical hybrid surveying process and a workflow tailored for India's technical, regulatory and operational environment. The workflow merges ground surveys and UAV (Unmanned Aerial Vehicle) photogrammetry to generate accurate, timely and environmentally responsive datasets for mid-scale and large-scale projects. The method involves selecting for pilot sites – such as institutional campuses for mid-scale and urban development/redevelopment sites for large-scale projects and executing both traditional ground control survey and drone flights. The resultant datasets are unified according to common workflow framework. The research assesses key parameters like survey time, data processing, accuracy, software compatibility, cost, area coverage and environmental mapping precision to assess usability and design impact. Findings confirm that the hybrid surveying method is highly effective and can reduce total time on site surveying substantially. Also yielding enhanced spatial and environmental information making workflow streamlined for the integration of datasets into digital architectural tools. Additionally, end-user's feedback reported an elevation in understanding of the site interpretation and passive design decisions. Challenges include regulatory compliance and complex data handling. The research demonstrates that standardizing hybrid survey workflows can address current technical and methodological gaps, leading to more efficient and sustainable architectural practices in India. This research lays the groundwork for a replicable workflow model that can transform surveying practice in India towards more sustainable, efficient, and digitally integrated futures.

Keywords:
Hybrid Surveying, Environmental Analysis, Standardized Workflow, Drone Photogrammetry, Traditional ground surveying, UAV

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