Drones and Web GIS based Street Naming and Household Addressing System: A case of Changu Narayan- An Urbanizing Municipality from Kathmandu, Nepal

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SUMMARY

The lack of a reliable street naming and house addressing system is a common issue in developing countries, which presents a significant challenge for navigation within cities. Existing methods, such as what3words, plus codes, six-point maps, and metric addressing systems, have their own limitations, including localization and cost. In addition, satellite image-based methods are not effective in densely populated urban areas with narrow streets and road networks. Changu Narayan Municipality, a rapidly urbanizing area in Kathmandu Valley, Nepal, has implemented an innovative initiative to identify, name, and number all of its road networks and households using advanced technologies such as drones and household-level data collected via mobile-based data collection tools. A semi-automated web-based system that can compute necessary distances and measurements over drone-based orthophoto maps to generate household addresses for individual buildings was used to support this project. This approach is the first of its kind in Nepal, where an entire municipality has been surveyed and mapped with drones, and the data collected has been used to generate house numbers and street addresses. The municipality plans to integrate the house numbering and addressing process with its existing methods for approving new building construction in the municipality. While the digital system developed using the drone-based methodology has significantly reduced the time required to map individual buildings, and roads, and identify street networks, the major challenge that remains is the naming of individual road segments, which requires a participatory approach involving consultation workshops in each local unit to validate the name of each road. This initiative is a model for other urbanizing cities in Nepal that can learn from this approach and adopt a similar strategy. The integration of drone technology and web-based GIS in this project has demonstrated the potential for creating a reliable street naming and house addressing system, particularly in areas with limited resources and infrastructure. This project has far-reaching implications for improving urban navigation, emergency services, and the delivery of goods and services.
