Advancing Expropriation Management through GIS: A Geospatial Perspective

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Key words: Cadastre; Capacity building; Cartography; Land distribution; Land management; Land readjustment; Keyword 1; Keyword 2; Keyword 3

SUMMARY

This article presents a comprehensive study on expropriation management in Saudi Arabia's south region, driven by urban development and infrastructure expansion. To acquire private properties for public projects, the study utilized advanced surveying techniques, Geographic Information Systems (GIS), remote sensing technologies, and dashboard visualization. The project involved precise data collection through Total Station and GNSS for accurate mapping of property boundaries. Remote sensing, using high-resolution satellite imagery and aerial photography, facilitated land use change detection and monitoring.

The study focused on expropriating over 2.5 million square meters of land to create a winter tourism center. GIS software packages were employed to generate maps, statistics, and necessary analyses for surface calculations and error distribution. This GIS system streamlined the process by automating calculations, equations, and parcel geometry, eliminating the need for manual procedures. Data were stored in a spatial database and presented dynamically with graphics, charts, statistics, and forms.

The project faced challenges due to the sensitive nature of expropriation, leading to the use of remote sensing techniques to gather information on each parcel. As a result, 850 parcels were expropriated, and multiple GIS reports were generated to evaluate the value of each parcel. This study serves as a novel approach to expropriation management in unorganized urban areas, encompassing land observation, inventory, estimation, data collection, data analysis, and report generation for all types of buildings, debris, and land.

Overall, the integration of surveying, GIS, remote sensing, and dashboard technologies revolutionized expropriation management in Saudi Arabia. The findings demonstrate the

significance of adopting advanced geospatial technologies to ensure sustainable and transparent expropriation processes while achieving broader developmental objectives