

Validation of Automated Feature Extraction for Cadastral Map Creation Using Satellite Imagery: A Case of Nepal

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SUMMARY

Estimates suggest that only thirty percent of the world's population has access to formal land administration systems to register and protect their land rights. Cadastral maps are a core ingredient of any land administration system and comprise information about the extent, value and ownership of land, which are essential for recording and updating land records. Surveying and mapping cadastral boundaries using traditional, field-based methods is accurate but can prove to be extremely time, cost and labour intensive. This makes it difficult to create or update existing cadastral maps in developing or less developed countries. Alternate methods that could provide cheap, fast and effective solutions to speed up cadastral boundary mapping are being investigated recently. With the advent of very high resolution (VHR) imageries, satellite remote sensing offers tremendous advantage as it has potential to provide automatic feature extraction tools/methods for boundary extraction which could be used for fit-for-purpose land administration solutions. In this paper, we assess and validate the utilization of automatic feature extraction method in Dholakha district, Nepal for cadastral map creation by comparing the results with cadastral boundaries collected by three different methods. First, we compare the output of the automatic feature extraction with an existing cadastral map. Second, the results are compared with the cadastral boundaries collected by participatory methods. Third, we compare the results with parcel boundaries acquired by using a mobile application for spatial data collection. In the latter two cases, farmers provide the boundary information. Visual interpretation shows some deviations among the results of different methods. Further, we quantify the deviations between the maps in terms of percentage of completeness and correctness. Considering this study is one of the first attempts in validating methods for cadastral map creation in a hilly terrain, the results will give an insight on the potential of automatic feature extraction for this purpose in Nepal. Promising results could lead to fit-for-purpose applications of the method for large-scale cadastral mapping.

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