Object-based Building Extraction in Tacna, Peru using WorldView-2 Images

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Abstract: Peru locates in the circum-Pacific seismic belt with high seismic and tsunami risks. In order to promote an earthquake disaster mitigation plan, damage assessment to scenario earthquakes has been conducted. Authors are currently conducting Peru-Japan joint research on earthquake and tsunami disaster mitigation. In this project, two case study areas: Metropolitan Lima and Tacna, were selected after the preliminary surveys. Building inventory data are necessary for seismic damage assessment of a region. However, in Tacna, building inventory data have not been created yet. Hence in this study, object-based building extraction was performed for WorldView-2 high-resolution satellite images. First, segmentation was carried out using multi-spectral band data and shape information. The obtained segments were further grouped into objects considering the neighborhood and similarity conditions. Comparing with the visual inspection result, the classified building objects were well extracted for large buildings standing alone. However for densely build-up areas, it was not so easy to detect small buildings one by one. Comparing with census data, building inventory database in the central Tacna city was created. The accuracy of the estimated building GIS data was examined by our field survey.

Keyword: object-based classification, WorldView-2, building extraction, damage assessment, building inventory