

Cadastral 2014 Japan – Initiatives for Restoring Original Boundaries in Mountains and Forests by Using Past Aerial Photos

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SUMMARY

Introduction Japanese cadastral is based on basic spatial units of land parcel (lots) segmented by lot boundaries. At present, however, there still remain land parcel (lots) whose positional information is unconfirmed. Especially in mountains and forests, it is increasingly difficult to confirm the land boundaries due to the advancing ages of land owners. In the real property registration system of Japan, a lot boundary that identifies a land parcel (lot) is defined as “two or more points and line(s) that connects such points that are recognized as constituting a boundary of a land lot at the time of its registration.” (Article 123 (i) of Real Property Registration Act) In other words, a land lot cannot be established anew, but it needs to be found by surveying and searching the originally registered land parcel. For this reason, the past information of the area including its land parcel is extremely important, but such information is unorganized, scattered and unclear in many cases. Having said the above, this study takes into consideration the past information sources for those unconfirmed land parcel for the purpose of studying possible methods of restoring the original land boundaries in mountains and forests through use of such spatial information as maps provided at the registry offices, topographical maps, and aerial photos with the earth’s gravity center as the datum point. By so doing, we also aim at clarifying issues that involve the spatial information in the cadastral system of Japan.

Content A 3-D model was prepared by GNSS survey (FKP method) of past aerial photos and structures on site that have been in existence from long ago, and then a 3-D diorama and ortho-image thereof were prepared. Next through the combination of stereoscopy of the stereo image and 3-D CAD (Civil 3-d), the 3-D boundary lines were overlaid with the 3-D topographic model and thus estimated original boundary lines of the land were restored on a large scale map in reference to the maps provided at the registry office.

Conclusion The method discussed in this study may be useful for surveying the boundaries of a land parcel (lot) in mountains and forests in our depopulating, aging society. The issue regarding the spatial information in the Japanese cadastral system is that each piece of the spatial data we used in this study was kept at a different location from other pieces, and most of them are paper-based. Moreover, such data were not prepared on a unified coordinate system. In a near future in Japan, “mottainai (wasted) or buried cadastral information” is going to be restructured and archived as spatial information data to be publicized while being linked to the registry information. If such an initiative for utilizing the citizens’ knowledge can contribute to the improvement and rationalization of urban planning and public services, it will also enable us to effectively counteract the aging population with declining birthrate and to build a community resistant to natural disasters.

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