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Study on the change in paddy field in dissected valley in Shimosa Upland, Chiba Prefecture

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SATOYAMA is secondary nature in new equilibrium by human participation. Many YATSU, dissected valleys, are formed in Northern part of Shimosa Upland, Chiba Prefecture. Dissected valley is used for rice cultivation, and many ecosystem services are produced from SATOYAMA environments including paddy field. However, recent development impair these services. This paper attempts the detection of abandoned paddy field by satellite remote sensing.

Land condition map (GSI) and Vegetation map (ME) are used to extract valley bottom plain. As for satellite images, ALOS/AVNIR2(May and August in 2009) and LANDSAT/TM (May, 1990 and September, 1993) are used to detect paddy field and abandoned paddy within the valley bottom plain. In spring, paddy field is filled with water and summer paddy is covered with canopy of rice. NDVI difference between summer and spring is large in paddy field, on the other hand, it becomes small in abandoned paddy, that usually is wetland.

Distribution of paddy and abandoned paddy fields in dissected valley bottom plain in early 1990's and in late 2000's are mapped, and verified by using high spatial resolution images such as Google Earth and field survey. The maps show housing development in early 1990's in western part of Shimosa upland, and land use changes are progressing in the eastern part of Shimosa Upland in late 2000's.

This study shows that extraction of abandoned paddy field in the dissected valley (YATSUDA) in Shimosa Upland is possible by using satellite remote sensing. YATSUDA has many ecosystem services. We should not harm ecosystem services to maintain sustainable society. The authors consider that the map of abandoned valley can be used to examine the way of desirable future society.

Keywords: paddy in dissected valley, abandoned paddy fields, ecosystem services, Hokuso upland, Chiba Prefecture, remote sensing