Application of spatial analysis techniques for evaluation of farmland transformation pattern: A case study of Tainan County, Taiwan.

Liao Chin-Hsien  
Department of Urban Planning,  
National Cheng Kung University,  
Tainan, Taiwan  

Chang Hsueh-Sheng  
Department of Urban Planning,  
National Cheng Kung University,  
Tainan, Taiwan  

Abstract—To propose the appropriate plan for agriculture resources plays a key role in achieving the goal of ecological sustainability and sustainable development. Especially in Taiwan, due to urbanization and the impact of production scale diseconomies, the need for farmland transformation is under huge pressure. This trend has direct impact on town and country sustainable developing capacity, as well as the ability to compose an eco-city.

Accordingly, this paper aims to discuss the process of farmland transformation between 1995 and 2006 in Taiwan. The methodology will include adopting the Geographic Information System and Geoda in mapping the rice farmland, wasted farmland and non-irrigated farmland transformation distributions. In addition, the spatial autocorrelation analysis will be introduced in analyzing the relation strength between the characteristics of farmland transformation and spatial autocorrelation techniques are integrated into the cluster and outlier analysis, allowing exploration of possible spatial structural relationships and spatial patterns of farmland transformation in disaggregate and aggregate levels. Finally, this paper calculates the ecological footprint of farmland transformation will be conducted in order to further explore the characteristics of farmland development in Taiwan.

Keywords—Farmland Resource Transformation, Geographic Information System, Spatial Autocorrelation Analysis, Ecological Footprint