

Analyzing spatio-temporal patterns of agricultural land fragmentation in an urbanized region

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Fragmentation of agricultural land by urban sprawl affects both the agricultural production capacity and the environment. For decades, the problem of fragmentation is recognized in agriculture and the fragmentation of agricultural holdings has been a key argument for land consolidation projects in order to facilitate the shift from self-supporting mixed farming systems to a technology-oriented agriculture. However, fragmentation is not just a historical phenomenon but still on-going in many farm structures. Currently, urbanization puts pressure on farming systems due to (i) reduced expansion possibilities of farm units, (ii) influences on prices for land and (iii) more restrictive rules on farming when an increasing number of non-rural inhabitants has different expectations towards the countryside. Consequently, within strongly fragmented landscapes like the urban fringe, agriculture now competes with non-agricultural land uses for land. Pressure on and hence, fragmentation of agricultural land, is also a problem in Belgium. Therefore, taking policy decisions requires a comprehensive study of the impacts of land fragmentation on farming systems and on their surrounding environment. This article is an introduction to the agricultural land fragmentation problem as well as an attempt to explore factors beyond urbanization pressure on farming systems. This research therefore aims to identify rural land fragmentation in three case studies using spatio-temporal data within the framework of GIS. The study period covers ca. 15 years and is based on the combined use of agricultural land use maps originating from administrative farmland databases. The data serve to formulate a renewed framework that can be used to describe land fragmentation in agricultural areas. These fragmentation processes that emerge from our analyses are compared to those defined and recognized in the current spatial planning policy and in existing monitoring data. This should allow us to identify bottlenecks and options for future spatial planning policy in highly urbanized areas.