Tropentag, September 17-19, 2013, Stuttgart-Hohenheim

"Agricultural development within the rural-urban continuum"

Spatio-Temporal Dynamics along the Urban-Rural Continuum - A GIS-based Analysis of two African Cities

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Abstract

In the time of rapid urban transformation, urban and peri-urban agriculture has evolved as an important livelihood strategy for millions of urban dwellers in sub-Saharan Africa. Especially in small and medium-sized cities, cultivated areas can be seen as an integral part of the urban patchwork. Yet, little is known about the spatial extent of agricultural production in and around these cities and how the spatial parameters of this complex patchwork change along the urban-rural continuum. The purpose of this study therefore was to enhance the understanding of spatio-temporal dynamics of urban and peri-urban agriculture along the urban-rural continuum with a special focus on small and medium-sized cities in Africa.

Two cities were selected for this study: Moshi in Tanzania and Bamenda in Cameroon. Four transect polygons – 100 metres wide and up to 15 kilometres long – were laid out radially from the each city centre, building the spatial framework for the data collection and analysis process. Within these transects, all agricultural land use was mapped and with about 450 households per site, a representative number was interviewed. All data were digitised and geocoded, allowing for the spatial analysis of the two datasets. An urban-rural index (URI) was calculated based on building density and travel isochrones as the foundation of spatial analysis, ensuring that the process was not biased by the selection of conventional categories, such as urban, periurban or rural.

The results of this study revealed that almost all agricultural parameters showed significant correlations with the respective URI score. Even though correlations in land use data were usually larger than in household data, four characteristic patterns of spatial changes along the continuum could be identified. While the proportion of area under cultivation and mean patch sizes increased, building density or formal flat/house ownership steadily decreased with decreasing URI values. However, spatial changes in other parameters were less predictable. While construction activity and crop diversity were highest in periurban areas, the numbers on the duration of residence or land ownership were lowest in these areas.

Keywords: GIS, peri-urban, transect, urban agriculture, urban-rural continuum

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