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Socio-spatial dynamics in the use of wild natural resources: Evidence from six rapidly growing medium-sized cities in Africa

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ABSTRACT

Increasing urbanisation in sub-Saharan Africa transforms spatial configurations in and around towns and cities. At the same time wild natural resources play an important role in African livelihoods. Yet, little is known about the impact of urbanisation on the socio-spatial dynamics of the use of wild natural resources. Here we examined the importance of these resources for livelihoods, differences in their use between different locations along the urban-rural continuum, and the respective temporal dynamics. A total of 1158 households were interviewed in six medium-sized cities distributed across five African countries using a standardised questionnaire supplemented by expert interviews and spatial analyses employing Geographic Information Systems. Overall, even though periurban and rural households were more likely to use wild natural resources than those in the urban areas, the use of these resources was generally high along the entire urban-rural continuum. Despite the increasing urban pressure on these resources, they remain an integral part for most households, not only for those lacking access to productive resources, but also for those with a higher standard of living. This trend was found across all study towns, despite the marked differences in their respective socio-spatial as well as environmental settings.

Introduction

As of 2008 globally more people now live in urban areas than in rural environments (Montgomery, 2008; World Bank, 2009). Even though rural populations are still in the majority in sub-Saharan Africa, the region is already home to as many urban dwellers as North America (Satterthwaite, 2007). The continent's settlement patterns are rapidly changing and urban growth is likely to remain high for the next few decades (UN, 2012; White, Mberu, & Collinson, 2008).

Large cities such as Nairobi, Lagos or Johannesburg are vivid examples of the extent of changes related to urbanisation processes (Cohen, 2006). These cities shape the images of urbanisation in Africa that is associated with the rapid growth of slums, traffic congestion and an increasing gap between rich and poor. Whilst large cities are responsible for a significant portion of urban growth, the major changes and urbanisation rates are being experienced in small and mid-sized cities (SMCs) of less than 500,000 inhabitants (Cohen, 2006; Matuschke, 2009). Yet, current knowledge of urbanisation processes and how they shape livelihoods is dominated by discussions and results from large cities with little regard for the differences that may apply in SMCs and consequent differentiated policies and development strategies.

In 2010, more than 150 million Africans lived in SMCs while around 120 million lived in larger cities. As patterns of urban growth change and SMCs undergo fast transformation, they will become even more important in the future.

Urbanisation and food

One of the key changes resulting from urbanisation processes is a greater reliance of urban populations on purchased foods, the majority of which are imported from adjacent periurban and rural areas and even further afield. Indeed, ensuring an adequate food supply for growing urban and periurban populations is increasingly becoming a challenge (FAO, 2002), especially in the face of rising food prices. Furthermore, food prices are increasingly volatile and less predictable (FAO, 2012), due to, inter alia, changes in global

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weather patterns and commodity speculation (World Bank, 2008). Consequently, poorer urban residents, and often new migrants to cities need to spend higher shares of their cash income on food than their rural counterparts (Maxwell, 1999; Maxwell et al. 2000). As a consequence, food-energy deficiency incidences are more frequent in urban than in rural areas (IFPRI, 2007). However, manifold adaptation and mitigation strategies have evolved to limit food insecurity, including alternative forms and locations of food production, widely known as urban and periurban agriculture, which are carried out in a variety of small spaces and using systems very different to conventional rural food production systems. Another urban and periurban strategy that is often overlooked by urban planners and policy makers in both the developed (Kilchling, Hansmann, & Seeland, 2009; McLain, Poe, Hurley, Lecompte-Mastenbrook, Emery, 2012) and developing world (Drescher, 1998; Kaoma & Shackleton, 2014) is the gathering and hunting of wild foods and associated resources (such as firewood to cook food). These foods include wild vegetables, fruits, bushmeat, edible insects, fish, mushrooms and honey that are collected in and on the peripheries of SMCs for self-consumption and marketing purposes (Kaoma & Shackleton, 2014). Even though this is not a new phenomenon, the use of wild natural resources has so far been investigated as a part of rural livelihoods rather than with the dynamic and 'modern' urban landscapes. For example, large markets can be found trading a variety of wild products, such as the bushmeat markets of central and west Africa (e.g. Bowen-Jones, Brown, & Robinson, 2003) and wild vegetables in Africa and Asia (e.g. Shackleton, Pasquini, & Drescher, 2009; Xu et al. 2004). At the household level, urban and periurban citizens collect wild foods for home consumption from remnant spaces (e.g. Davenport, Gambiza, & Shackleton, 2011; Kilchling et al. 2009) or even nurture key species within their own home spaces (Kaoma & Shackleton, 2014). However, the spatial changes in procuring such foods as urbanisation advances, or the driving processes of wild food use in such settings, has been little explored. This ties back to debates on urban agriculture as another means of limiting food insecurity at the household level and income generation at larger scales (Drescher & Iaquinta 2002).

Periurban areas are particularly dynamic because they represent the interface between the urban and the rural, and residents employ a mix of both urban and rural livelihood strategies. Importantly, the area of undeveloped land is greater than the urban core and so the potential supply of wild resources is higher. However, these periurban spaces undergo rapid spatial and temporal changes as new migrants arrive in towns and as towns expand, frequently resulting in conflicts for land, space and resources (e.g. Briggs, 1991; Darly & Torre, 2013). Without appropriate policies and planning structures key resources may decline in abundance, accessibility or quality, potentially undermining the livelihoods of those making widespread use of them. Thus, the formulation of appropriate policies to sustain the gathering of wild natural resources as a contribution to urban and periurban livelihoods requires a comprehensive understanding of their importance and scope, especially in the periurban areas of SMCs in the developing world.

Research hypotheses

This paper contributes to the understanding of periurban transformation processes and their implications for the use of wild natural resources following four research hypotheses: (1) Wild natural resources are an important aspect of livelihoods in and around medium-sized African cities; (2) Their importance is related to a household's location on the urban-rural continuum; (3) The urbanisation processes reconfigure the spatial foundation for use of land to either grow crops and keep livestock or to gather wild natural resources and (4) The use of wild natural resources persists as an important livelihood strategy across time and space. The more settled the households are the more important domesticated resources (e.g. cultivated or semi-cultivated crops and livestock) become within their livelihood. We argue, however, that a lack of access to productive resources, such as land and livestock, leads to gathering of free wild resources as an attractive alternative to the use of domesticated resources. Despite the growing pressure on wild resources in the course of rapid urban development, food hunting and gathering persists as an important livelihood strategy.

Materials and methods

Study towns

This study was conducted in and around six SMCs in five sub-Saharan African countries. They were selected on the basis of (1) having a relatively high growth rate for the country context, (2) being SMCs in which the authors already had research programs and thus links with urban officials, and (3) to provide a range of climatic types (Table 1). Most of the six selected SMCs are currently experiencing rapid urban growth, not only in terms of population but also in terms of spatial transformation of their immediate surroundings and their hinterland. This rapid urban growth has led to large changes in the use and availability of land and resources.

Research methods

A multi-method approach was adopted, integrating household survey data, expert interviews, and the application of Geographic Information Systems (GIS). All data collection activities thereby aimed at covering the diverse livelihood portfolios of the population directly or indirectly affected by urbanisation induced changes. A standardised household questionnaire was developed to probe livelihood strategies and assets, with an emphasis on the use of wild natural resources. In this context, wild natural resources are synonymous with the term "non-timber forest product", regarded as biological products harvested from local natural or modified spaces for direct use or small-scale trade (Shackleton, Delang, Shackleton, & Shanley, 2011). The questionnaire mainly consisted of closed questions, with a number of possible answers provided based on local expertise and pretesting. In some parts open questions were included to provide greater depth. In addition to covering general household characteristics, such as household size and income, the questionnaire focused on the households' involvement in agricultural activities, volumes, origin and types of wild natural resources consumed by the households, as well as their perceptions on changes in availability and prices of these resources associated with urban growth.

To capture changes along the urban-rural continuum, a total of 1158 households were sampled using a transect approach (McDonnell & Pickett, 1990). Transects were laid out from the urban centre through the periurban realm to the rural hinterland. At three or four points along each transect (corresponding to the urban, periurban and rural zones) a random sample of 30–100 households was drawn and interviewed. Randomisation was on the basis of numbering households visible on the most recent remote imagery. The locations of all interviewed households were captured using a handheld Garmin GPS device to facilitate in-depth follow-up discussions with selected respondents and to allow for the spatial analysis of household data. Interviews were conducted in the local language with the household head, or if the head was absent, any other adult member of the household. Sampling including weekends to avoid missing potential respondents who