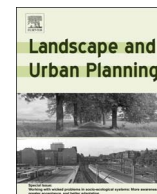




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Landscape and Urban Planning

journal homepage: www.elsevier.com/locate/landurbplan

Research paper

A socio-geographical approach to the diversity of urban agriculture in a West African city

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ARTICLE INFO

Keywords:

Urban agriculture diversity
 Urban fringe
 Land use
 Space-time analysis
 West Africa

ABSTRACT

There is a substantial body of literature addressing urban agriculture (UA) and its diversity. But the reasons for this diversity and the perseverance of UA in today's cities are complex, and few studies have been conducted on a regional scale that focuses on the UA dynamics involved. We took this approach in a multi-scale and space-time analysis of UA in the African city of Bobo-Dioulasso (Burkina Faso). In order to identify determinants of the transformations in agriculture within the city and its urban fringe we analyzed interactions from two main perspectives: (i) between urban and agricultural dynamics in both the city and on a regional scale, and (ii) between land status and actor strategies at the intra-urban scale. The analysis is centered on three areas of urban fringe that have been subjected to various land use changes over time and illustrate the different ways that farmers have adapted to urbanization. On a regional scale, results show how agricultural and regional market dynamics foment UA development by providing commercial outlets and producing agricultural inputs. At the local (city) scale, results show how and why different forms of UA have emerged in specific locations that reflect the socio-economic profile of farmers (ranging from autochthonous urban farmers to relatively wealthy urban dwellers), their access to resources, the possibility of intensifying farming activities, and the formal or informal land negotiations and transactions between the various categories of actors. We conclude with a discussion of the theoretical implications of this research and its relevance to public policy. Our analysis underlines the pertinence of comprehensive and qualitative approaches for analyzing the complexity of UA dynamics and enhancing the position of agriculture in land planning for geographically-specific urban contexts.

1. Introduction

Urban agriculture (UA) plays an economic, social and environmental role in many cities worldwide (FAO, 2012; Smit, Ratta, & Nasr, 1996). In sub-Saharan Africa, rapid urbanization is challenging the modalities of adaptation and the future of this agricultural activity (Satterthwaite, McGranahan, & Tacoli, 2010). But despite land pressures from this urban dynamic, UA endures, developing and adapting, and providing a livelihood for numerous families in many African cities (Lee-Smith, 2011).

Many studies have been aimed at describing UA, its diversity and what distinguishes it from rural agriculture (Dossa, Sangaré, Buerkert, & Schlecht, 2015; Mougeot, 2000; Prain & de Zeeuw, 2007). Others have examined the characteristics of UA in order to propose strategies for its inclusion in urban planning policies (Dubbeling, de Zeeuw, & van Veenhuizen, 2011). In describing UA diversity, researchers have mainly focused on land use dynamics in urban areas (Asomani-Boateng, 2002; Brinkmann, Schumacher, Dittrich,

Kadaore, & Buerkert, 2011; Kêdowidé, Sedogo, & Cissé, 2010), or on social and technico-economic characteristics of farming systems (Amadou, Dossa, Lompo, Abdulkadir, & Eva Schlecht, 2012; Ba & Aubry, 2010; Danso, Drechsel, Wiafe-Antwi, & Gyiele, 2002). Few studies have used a regional scale to combine space-time analysis with an analysis of the evolution in farming systems (Aubry et al., 2012). This type of investigation can help explain the endurance of UA in certain urban spaces, anticipate possible future trends and contribute to the development of appropriate urban planning policies. These are the objectives of our research on UA in the urban fringes of a sub-Saharan city. We define rural-urban fringes as the peripheral limits of a city that mark an urban-rural transition where the process of urbanization leads to important land use changes. When agricultural land is overtaken by advancing urbanization, and becomes subject to the framework of urban planning, it suffers from the severe pressure of unfavorable competition for land use (Aloko-N'Guessan, Diallo, & Kokou, 2010; Nkambwe & Arnberg, 1996; Vennetier, 1989). This urban fringe is frequently in transition, making it an attractive space for the analysis of

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Received 12 December 2016; Received in revised form 8 September 2017; Accepted 13 September 2017

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land use changes, and adaptation strategies for farming. The urban fringe can display rapid and sometimes radical spatial transformations, yet we see examples where agriculture endures, adapts and transforms in the face of urbanization. Competition between different land uses leads to the spatial reorganization of farming activities in urban fringes (Inwood & Sharp, 2011), disrupting former agricultural systems while stimulating the emergence of new ones.

In this article we intend to highlight the diversity and the transformation of UA in the case of Bobo-Dioulasso (population 700,000), the second largest city of Burkina Faso, in West Africa. This analysis takes into account the different forms of UA, the actors, and the places involved at the regional level. Our focus on rural-urban fringes allows us to address questions of how UA has evolved (and continues to evolve), and what are the drivers and underlying processes of this evolution. Following a review of the state of the art in approaches to the study of UA diversity, we describe our study site and methodology. The results are presented in two steps. First we describe agricultural and urban dynamics at the regional scale over the past decades. Then we analyze a shorter time span (one generation) and a smaller scale (from the neighborhood to the individual) to identify the origins of the type of urban agriculture observed today. We characterize the actors involved and the variables that explain the spatial distribution of the different categories of urban agriculture. The theoretical and applied inputs of our approach are exposed in the discussion.

2. The diversity of urban agriculture in Sub-Saharan Africa

Describing the diversity of UA in Sub-Saharan Africa is a complicated affair. It is practiced in a wide variety of places, by actors with different socio-economic profiles, utilizing numerous forms of production. The drivers of this diversity reflect the contrasting socio-economic and political contexts that surround its development. A review of the literature reveals two main perspectives used in the characterization of UA diversity: one centering on spatial aspects, and another that focuses on the social and technico-economic aspects.

2.1. Spatial dynamics in the diversity of urban agriculture

Part of the literature describes the diversity of urban agriculture according to the types of spaces where it is practiced. Temple and Moustier (2004) defined areas of UA according to their location and relationship to the urban food supply, and differentiate between intra-urban, peri-urban and rural-urban agriculture. Asomani-Boateng (2002) categorized urban cultivation in Accra (Ghana) on the basis of three types of location: open/vacant space cultivation, home or household gardening, and peri-urban cultivation.

The characteristics and spatial limits of UA are fluid and must be analyzed dynamically with respect to their relationship to urbanization processes. Some studies have used a spatial approach to assess the transformations of cultivated areas in African cities over time. Drechsel and Dongus (2010) and Kêdowidé et al. (2010) observed the spatio-temporal changes of urban spaces cultivated in Ouagadougou (Burkina Faso) and Dar es Salam (Tanzania), respectively. Brinkmann et al. (2011) compared the landscape transformation processes in four West African cities and noticed that the expansion of intensive crop cultivation took place mainly in the urban fringe as an adaptation to the scarcity of available land. In Gaborone (Botswana), analyses of land-use changes in the urban fringe show that the coexistence of a tribal land tenure system and a free market system have led to complex land transactions where agricultural land uses compete favorably with urban land uses (Nkambwe & Arnberg, 1996). These spatial approaches focus specifically on cultivated open spaces. Indeed, the dynamics of urban livestock production cannot be assessed with spatial approaches because they are often soilless productions – which makes them difficult to identify on aerial and satellite photographs – and much of the official statistical data are not sufficient to demonstrate how livestock

productions are evolving within cities. Additionally, these spatial approaches often fail at explaining the underlying processes that drive land use changes. Franck (2007) has broadened the understanding of urban agriculture dynamics in Karthoum (Soudan) by underlining the links between the geographic and ethnic origin of migrant families and the type and location of productions they develop. This kind of approach generates useful insights into the space-time adaptation processes of urban farmers.

2.2. Characterizing urban agriculture diversity through the analysis of farming systems

Agronomic research has frequently used system approaches to study the adaptation of agriculture to environmental, economic and socio-political changes. The concept of “farming systems” was developed in the basic research of rural agriculture analysis (Ruthenberg, 1971), and was later used to build typologies of urban agriculture (Aubry et al., 2008). Early UA typologies in West Africa focused on the various types of cropping system implemented (Danso et al., 2002) and their relationship with economic strategies (Kessler, 2002). Urban livestock production has been less present in the literature, although its diversity has been described through technical aspects to differentiate urban from rural livestock production (Dossa et al., 2015; Kiendrebeogo, 2006). In an attempt to compare the diversity of UA at the regional scale, several authors developed a systemic classification based on the diversification of farm activities, the endowment of farm resources and the orientation of production as commercial or domestic (Amadou et al., 2012; Bellwood-Howard et al., 2015; Dossa, Abdulkadir, Amadou, Sangare, & Schlecht, 2011). Their works highlight the fact that similar production systems can be found in different West African cities. While these quantitative analyses provide helpful input for understanding the combination of farming activities in urban production systems, they do not explain the socio-economic profile of urban farmers or the underlying logics in the development of such farming systems.

Part of UA classifications depends on the role of urban farming in the overall household strategy. Most authors agree on the fact that UA is developed by families with very different socio-economic profiles, whether poor or rich, and for different purposes (Crush, Hovorka, & Tevera, 2011; Moustier & Danso, 2006; Sawio, 1994). Maxwell (1994) identified different categories of household logics in the development of UA, from commercial production to survival strategy. He linked these economic strategies with overall family income and accessibility to arable land. Based on the same idea, Moustier and Danso (2006) underlined different types of urban farmers ranging from home based, intra-urban subsistence farmers to urban and peri-urban agricultural entrepreneurs. They demonstrated that entrepreneurs originate from other sectors than agriculture and are able to invest while poor urban farmers often find it difficult to increase the scale of their production.

Urban farmers often combine farming and off-farm activities. In Togo, Schilter (1991) differentiated between full time, part time, and temporary urban farmers. In the same way, comparative typologies have been built in Madagascar, Senegal, and France (Ba & Aubry, 2010) according to the type of off-farm activities (related or not to agriculture) and the time spent on these activities. These typologies provide information that furthers our understanding of UA diversity by analyzing the ways in which combinations of different activities enhance sustainability (Ramamonjisoa, Aubry, Dabat, & Andriarimalala, 2007). However, when the scale of analysis remains at the level of the farming or activity system, it is difficult to understand the degree to which geographical and political factors influence UA development strategies. Socio-geographical approaches on a regional scale are thus needed to provide a full analysis of UA dynamics.

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