



Understanding peri-urban maize production through an examination of household livelihoods in the Toluca Metropolitan Area, Mexico

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ABSTRACT

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The rates of urban growth globally continue to rise, especially in small and intermediary cities and peri-urban areas of the developing world. Communities in these settings share characteristics with rural areas, in terms of continued connections with agriculture, yet with an increasing reliance of non-agricultural employment which poses challenges for policy and planning shaped by dichotomous configurations of space. This study focuses on maize producers in the Toluca Metropolitan Area, west of Mexico City, which is a traditional maize production region that also has exhibited high rates of industrial and residential growth over the last thirty years. We utilize household surveys from three peri-urban communities to create livelihood cluster groups that tease out the value and role of maize production amongst urban growth. The results show that maize plays various roles for households, including an insurance strategy against volatile job markets and for preference in making homemade tortillas. Rural and urban livelihoods in this region are mutually dependent on each other and not necessarily reflecting a linear rural–urban transition, which could lead to the persistence of maize production in the future. The continuing importance of maize in the Toluca Metropolitan Area provides policy opportunities to recognize and support the crop for household and regional food security despite continued urban growth.

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1. Introduction

Over half of the world's population is now concentrated in urban areas. Urbanization presents various social and environmental challenges such as concentrated poverty, negative environmental externalities and problems for achieving food security (Redman and Jones, 2005). Particularly in the developing world, urbanization entails regions of dynamic interaction between traditionally rural and newly urban land uses and livelihood activities at the urban periphery or “peri-urban” areas (Tacoli, 2003; Simon, 2008). As concerns grow over the continued loss of agricultural land to urban growth, and the attrition of farming populations to urban centers, it is increasingly important to understand how food production persists in urbanizing regions.

The livelihoods pursued by households in peri-urban areas are composed of production and consumption activities that represent

a fusion of typical rural and urban activities. Peri-urban producers are similar to typical rural producers in much of the world that subsidize agriculture through non-farm income sources (Netting, 1993; de Janvry and Sadoulet, 2001; Reardon et al., 2007). In the case of peri-urban agriculture, however, the proximity to urban centers also can create nearby market demands from consumers that seek out traditional foods (Lerner and Eakin, 2011). Additionally, the tradition and culture of agriculture in a region might encourage some producers to continue planting despite also having stable non-farm income (*ibid*). This study uses the example of peri-urban maize production in the Toluca Metropolitan Area, to the west of Mexico City, to assess the distinct ways that agricultural identity and maize production persist in peri-urban areas in light of the stressors of urban growth and agricultural policy shifts that undermine its persistence.

Maize is a traditional and iconic crop that continues to be grown by at least 2.6 million people in Mexico (SIAP, 2012), despite the continued challenge of climate variability and soil degradation, the withdrawal of federal supports for small-scale maize production, and the liberalization of maize through the North American Free Trade Agreement. Mexico's ability to produce a significant portion of the maize its population consumes as food has historically been

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a strong policy objective (see Appendini, 2001), and has become a new concern in face of rising commodity prices globally (Keleman and García Rañó, 2011). In central Mexico, where the human demand for maize is concentrated, urbanization not only is converting farmland into residential and industrial use but also is absorbing much of the rural labor force in urban labor markets (Appendini and Torres-Mazuera, 2008). Nevertheless, there are other forces at work that may motivate the continued production of smallholder maize in this dynamic context, including the use of maize for household consumption in the form of homemade tortillas when non-farm income sources are scarce or volatile. Additionally, new consumer demand can surface in urban areas as some populations seek traditional foods that can be supplied by peri-urban producers (Barkin, 2002; Appendini et al., 2003; Keleman and Hellin, 2009; Lerner and Eakin, 2011). In other words, the persistence of maize production in peri-urban areas suggests that some households are not in some “evolutionary stage” of modernization (Netting, 1993: 19), and instead continue production for risk aversion, tradition, and food preferences.

In this article, we will review the nature of peri-urban livelihoods and the specific context of peri-urban maize production in Mexico, particularly as it relates to tradition and identity. We then use a cluster analysis to create a livelihood typology that explores the motivations and value of maize production for peri-urban households that produce or have abandoned maize. The results reveal four main livelihood groups who vary in the use and importance of maize in terms of household economic activities, values and preferences. In the diverse strategies observed here, maize plays various roles, shaped by the needs of households and their available assets as they are exposed to urban and demographic change. Our analysis demonstrates the multiple functionality of maize in the urbanizing environment, including as an insurance strategy against uncertain or volatile income sources and for the preference of households for homemade tortillas. Additionally, we find that there is not a linear transition from rural to urban livelihoods in this region suggested by classic Modernization theory (see Rostow, 1960); rather there is a presence of both rural and urban activities that are mutually dependent on each other. The persistence of maize in this expanding urban area indicates a cross-sectoral policy opportunity to facilitate and even encourage small-scale production for household and regional food security.

2. Background

2.1. Maize and identity in Mexico

Mexico is the birthplace of maize, leading to a long history of cultivation and center for traditional heirloom or *criollo* varieties (Piperno and Flannery, 2001). The indigenous communities in the Mexican highlands developed the *nixtamalization* process, where calcium carbonate is added to the grain while cooking it in order to extract more minerals and make it easier to grind into tortillas (Fitting, 2011). A variety of traditional foods eaten every day across the country are based on this process, either made by grinding maize grain, by using a processed maize flour purchased in supermarkets, or by purchasing products already made through the grain or flour. Although the majority of consumers in Mexico eat tortillas purchased in *tortillerías* or supermarkets, approximately a quarter of human maize consumption in Mexico is in the form of handmade tortillas from household or regional grain (Keleman and García Rañó, 2011).

Maize in Mexico is usually produced in one of two major production systems: irrigated, input-intensive and commercial production mostly in the northwest (35% of total production), or rain-fed, small or medium-scale production in the central and

southern highlands (Fox and Haight, 2010; Keleman and García Rañó, 2011). The national government has actively supported commercial agriculture in the north through subsidies for inputs and transportation while support for smallholder production dwindled since the late 1980s, being replaced by welfare programs such as *Oportunidades*, a cash transfer program for women and children (Fox and Haight, 2010). This shift in government support is what Elizabeth Fitting calls a “neoliberal corn regime,” which included the liberalization of maize through the North American Free Trade Agreement (NAFTA) and the removal of the National Company of Popular Subsistence (CONASUPO) which provided a guaranteed buyer of grain for all producers. Additionally maize prices shifted from being established by the government to being based on the Chicago Board of Trade (Fitting, 2011).

Approximately half of the agricultural land in Mexico is currently found in *ejidos*, the communal land areas granted to landless Mexicans after the Revolution, starting in 1917 (Johnson, 2001). Each member or *ejidatario* received a plot for farming, a plot for house building (sometimes the same plot) and access to communal land areas for animal grazing. Many ejidos, especially in peri-urban areas, now have an urban center where most inhabitants live and are surrounded by parcels where ejidatarios still practice agriculture. Each ejido has a governing council (*comisariado ejidal*) that is responsible for decisions regarding ejido funds, coordination for the harvest, land sales and titling, relationships with municipal and state agrarian agencies, and until 1980, the urban growth and construction of official buildings in the community. Since 1992, when the Mexican constitution was amended to allow the titling and thus sale of ejido land, the institutional basis for the ejido has been eroded. Today ejidos still exist, albeit with a diversity of tenure arrangements; nevertheless, the degree to which the ejido council is active in local land management and governance varies.

Of particular importance in Mexico is the cultural asset linked to being a *campesino*. The term *campesino* (literally person of the countryside) refers to a smallholder producer, particularly in the context of national land reform and the creation of ejidos that ended in 1992. The concept of the *campesino* has been discussed throughout Mexican literature and theory as a specific political class tied to small-scale production which is often related to maize (Warman, 1972; Torres-Mazuera, 2008: 240; Fitting, 2011). Warman (1972) states simply that “it is necessary that a *campesino* have a relationship with the land in order to cultivate” (116). However, there is a deeper and more political meaning of *campesino* that is “a distinct social group united by a shared set of political and economic interests as well as by a collective history of oppression” (Boyer, 2003: 3). It can be inferred that as households become less tied to land and more linked to urban areas for employment and lifestyle choices, they are also less likely to identify with being a *campesino*. Yet the persistence of such cultural ties to land and production may also be a motivating factor for some households to continue to produce, even in rapidly urbanizing regions. Indeed, household livelihoods based on maize production are often subsidized by remittances and non-farm employment, leading to perhaps a reconfiguration of *campesino* identity (Barkin, 2002; Fitting, 2011).

2.2. Peri-urban livelihoods

The study of household livelihoods has emerged from global concern over poverty alleviation and quality of life, particularly in rural areas of the developing world (Scoones, 1998; Ellis, 2000). Livelihoods encompass the “capabilities, assets (stores, resources, claims and access) and activities required for a means of living” and are influenced by larger-scale political-economic processes and

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