



Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis



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ABSTRACT

Evidence assembled in this special issue of *Food Policy* shows that rising rural population densities in parts of Africa are profoundly affecting farming systems and the region's economies in ways that are underappreciated in current discourse on African development issues. This study synthesizes how people, markets and governments are responding to rising land pressures in Africa, drawing on key findings from the various contributions in this special issue. The papers herein revisit the issue of Boserupian agricultural intensification as an important response to land constraints, but they also go further than Boserup and her followers to explore broader responses to land constraints, including non-farm diversification, migration, and reduced fertility rates. Agricultural and rural development strategies in the region will need to more fully anticipate the implications of Africa's rapidly changing land and demographic situation, and the immense challenges that mounting land pressures pose in the context of current evidence of unsustainable agricultural intensification, a rapidly rising labor force associated with the region's current demographic conditions, and limited nonfarm job creation. These challenges are manageable but will require explicit policy actions to address the unique development challenges in densely populated rural areas.

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Introduction

This special issue is motivated by evidence that rising rural population densities in parts of Sub-Saharan Africa¹ – combined with policy choices, broadly defined – are profoundly affecting farming systems and indeed the overall trajectory of economic systems in ways that are underappreciated in current discourse on the region's development. Contributions to this special issue show that rising population pressure is linked in one way or another to (i) the shrinking size of most smallholder farms over time; (ii) more continuous cultivation of fields, contributing to land degradation and unsustainable forms of agricultural intensification; (iii) the rise of land rental and purchase markets and changes in land allocation institutions, all of which are rapidly altering farm structure; and (iv) the challenges that Sub-Saharan Africa is currently experiencing in achieving broad-based and inclusive forms of farm income growth.

The extent, distribution and exploitation of land are factors that have long been identified as fundamental influences on agricultural development paths and poverty reduction (Malthus, 1798; Boserup, 1965; Ruthenberg, 1980; Binswanger and McIntire, 1987; Binswanger and Pingali, 1988). There is no reason why this statement should be less true in sub-Saharan Africa than in other regions, yet recent research and policy discourses have largely misidentified or underestimated the heterogeneous nature of Africa's land endowment. Africa is typically characterized as land abundant, with the implication that land endowments pose no serious constraint for agricultural development. At the continental level, this is true. Estimates show that 52% of the world's remaining arable land is in Africa (Deininger et al., 2011). Yet most of this land is concentrated in just eight countries, while a number of the remaining countries contain large rural populations clustered in remarkably small areas (Chamberlin et al., 2014). Africa is equally heterogeneous at disaggregated levels. Just 1% of Africa's rural land area contains 21% of its rural population, while 20% of its rural lands contain 82% of its rural people. The most densely populated 20% of Africa's arable lands contain 25 times more people than the least densely populated 20%.

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¹ Hereafter "Africa" for short-hand.

Consequently, our starting point for studying the impacts of population density is the recognition of Africa's spatially heterogeneous distributions of rural populations, giving rise to acute localized land pressures being experienced by many rural Africans co-existing with large swaths of apparently unutilized arable land in other parts of the region. Although policy discourses typically identify challenges facing agricultural development in sub-Saharan Africa as a whole, these "two Africas" – land abundant and land constrained – may face fundamentally different challenges, with commensurately different implications for the types of development strategies that are best pursued in each.

Africa is currently witnessing intense competition for fertile land and water among four main groups: rural communities (mostly smallholder farmers) that are continuing to experience population growth,² relatively wealthy urban-based people who are investing in land at a rapid pace, foreign companies attracted to Africa's abundant and relatively cheap supply of agricultural land, and national governments. State leaders have long recognized the political-economic dimensions of control over the allocation of land (Herbst, 2000). In recent years, as land values have risen dramatically in parts of the region, states have tended to more aggressively wrest control of it from traditional authorities (Deininger et al., 2011). Demand for fertile land in Africa will almost certainly intensify along with rapidly increasing global demand for food, in part because the potential for crop area (and water use) expansion in North America, Europe and most of Asia is very limited (Deininger et al., 2011).

This special issue of *Food Policy* has three broad objectives. The first is to determine the extent to which land availability is a constraint on income growth in densely populated rural areas, and to identify different sources of constraints to land expansion. Chamberlin et al. (2014) revisit the question of how much potentially arable cropland exists in sub-Saharan Africa using recent high-resolution spatial data, and building on previous research by using available farm budgets to model the profitability of small-scale and large-scale expansion into new areas. They also discuss the many constraints to cropland expansion, including infrastructure, disease burdens, agroecological limitations and institutional factors. Other papers go deeper into the institutional constraints to cropland expansion and redistribution, with a focus on land markets (Holden and Otsuka, 2014) and land governance (Deininger et al., 2014, 2011). Schoneveld (2014) provides perhaps the most detailed and carefully documented inventory of foreign large-scale land acquisitions in Africa. Other studies explore the factors driving the apparent meteoric rise of medium-scale farmers, who now control more farmland than small-scale farmers in some countries (Sitko and Jayne, 2014, for the case of Zambia; see also Jayne et al., 2014).

A second objective is to document how African farming systems are responding to these varying land constraints. As noted above, many works in the agricultural development literature have extended Boserup's seminal study (1965) examining the endogenous intensification of farming systems in response to mounting land constraints.³ However, until recently it has been difficult to empirically test Boserup's ideas because of the difficulty of merging localized agro-ecological conditions with farm panel survey data. Several of the articles in this issue have now done so using geo-referenced spatial data to examine farmer behavioral responses to variations in localized population density (Muyanga and Jayne, 2014; Headey et al., 2014; Ricker-Gilbert et al., 2014; Josephson et al., 2014). Two Ghanaian case studies focus on the very different context of agricultural area expansion incentivized by labor and power con-

straints, what this implies for the demand for agricultural mechanization (Diao et al., 2014) and whether this context is amenable to an Asian-style Green Revolution or some other agricultural development path (Nin-Pratt and McBride, 2014). Finally, several studies compare the different agricultural intensification paths of Africa and Asia, the two developing regions that are most pervasively dominated by smallholder farming (Headey and Jayne, 2014; Mellor, 2014; Liu and Yamauchi, 2014).

A third objective, however, is to go beyond the traditional agro-centric Boserupian approach by acknowledging the fundamental importance of the non-farm sector in providing opportunities for responding to land pressures, as well as the potential for demographic responses in the form of out-migration from land constrained areas, or reductions in fertility rates. Mellor revisits the theory and evidence on the linkages between smallholder commercial farms and broader economic development, while Headey and Jayne examine cross-country evidence of the thus far sluggish pace of diversification out of smallholder farming in Africa, as well as responses in achieved and desired fertility rates.

This article synthesizes the main findings from the special issue and considers how they inform a central policy question: Given what we now know about the continent's complex land and population dynamics, what are the implications for Africa's development strategies? Building on a wide range of existing literatures, the various studies in this issue provide a firmer evidence base for informing this question in a more holistic manner. Spatially, we have a much better sense now of where the potential for land expansion is limited and therefore where land productivity growth will be required for smallholder agricultural growth. And while input intensification will be increasingly important in densely populated areas, evidence suggests that heavy investments in soil fertility restoration will be required to create the conditions for profitable and sustainable intensification (Drechsel et al., 2001; Tittone and Giller, 2013). Most country studies in this special issue indicate limits to endogenous agriculture intensification in terms of a declining relationship between the value of net farm income per land and labor unit and population density at high levels of density (Ricker-Gilbert et al., 2014; Muyanga and Jayne, 2014; Headey et al., 2014; Josephson et al., 2014). Problems of diminishing returns to agriculture at high levels of rural population density were relieved or avoided in much of Asia through exploitation of irrigation potential as well as through competitive outward-looking non-farm sectors that greatly rewarded personal investment in education and migration (Liu and Yamauchi, 2014). Labor was essentially "pulled" out of rural areas into urban-based employment. There still remains great potential for such processes to unfold in Africa (with appropriate policies and incentives), and in some countries, such as Ghana, these processes are already somewhat advanced (Diao et al., 2014; Nin-Pratt and McBride, 2014).⁴ Perhaps the most important overarching conclusion, articulated by Mellor, is that we should not interpret missed opportunities as a lost cause; decades of policies and regressive public investment patterns may have created an unbalanced playing field for African smallholders and depressed their role in driving forward structural transformation, but Asia's *green revolutions* were powered by small-scale farms and provide hope for what Africa might achieve with similarly supportive policies and public expenditures (Mellor, 2014).

The remainder of this synthesis paper is structured as follows. Section 2 elaborates on the various stylized facts raised above,

² Africa is the world's only region where rural population is still growing – by a projected 48% between 2012 and 2050 (United Nations, 2013).

³ See for example Binswanger and Ruttan, 1978; Ruthenberg, 1980; Binswanger and Pingali, 1988; Binswanger and McIntire, 1987.

⁴ It is important to note, however, that the urban manufacturing sector featured heavily in the Asian transformation, while manufacturing is a notably weak component of most of Africa's urbanization, which may impose significant limitations on how structural transformation plays out. See Glaeser (2013), Jedwab (2013) and Gollin et al. (2013) for recent assessments of urbanization without growth and poverty reduction, which appears to characterize much of Africa.

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