



ELSEVIER

Contents lists available at ScienceDirect

## Global Food Security

journal homepage: [www.elsevier.com/locate/gfs](http://www.elsevier.com/locate/gfs)

# Urbanization and farm size in Asia and Africa: Implications for food security and agricultural research<sup>☆</sup>

William A. Masters<sup>a,\*</sup>, Agnes Andersson Djurfeldt<sup>b</sup>, Cornelis De Haan<sup>c</sup>, Peter Hazell<sup>d</sup>, Thomas Jayne<sup>e</sup>, Magnus Jirström<sup>b</sup>, Thomas Reardon<sup>e</sup>

<sup>a</sup> Department of Food and Nutrition Policy, Tufts University, Friedman School of Nutrition Science and Policy, 150 Harrison Ave., Boston, MA 02111, USA

<sup>b</sup> Department of Human Geography, Lund University, Sweden

<sup>c</sup> Independent Consultant, The Netherlands

<sup>d</sup> Centre for Development, Environment and Policy, School of Oriental and African Studies, University of London, UK

<sup>e</sup> Department of Agricultural, Food and Resource Economics, Michigan State University, USA

## ARTICLE INFO

### Article history:

Received 27 May 2013

Accepted 2 July 2013

### Keywords:

Demographic transition

Structural change

Agricultural transformation

Rural development

## ABSTRACT

Urbanization and economic development have made global agriculture increasingly differentiated. Many hinterland farms remain largely self-sufficient, while farms closer to markets become increasingly specialized and linked to agribusinesses. Both semi-subsistence and commercialized farms remain family operations, with the few successful investor-owned farms found mainly for livestock and crops processed on site such as sugar, tea and oil palm. Meanwhile, demographic transition drives rapid change in farm sizes, with less land available per family until non-farm opportunities expand enough to absorb all new workers. Asia as a whole has now passed this turning point so its average farm sizes can rise, while in Africa average farm sizes will continue to fall for many years, posing special challenges in both hinterland and commercialized areas.

© 2013 Elsevier B.V. All rights reserved.

## 1. Introduction and motivation

This study is a synthesis of evidence assembled for the Consultative Group on International Agricultural Research (CGIAR), in a foresight workshop on “Trends in Urbanization and Farm Size in Sub-Saharan Africa and South Asia: Implications for Agricultural Research”, held 25–26 January 2013 at Tufts University in Boston, USA. The synthesis was written by the first author, through a consultative process commissioned by the Independent Science and Partnership Council (ISPC) of the CGIAR, using five background papers presented and discussed at the foresight workshop. This article thus reflects the contributions of all workshop participants, which included 25 experts on various aspects of agricultural development from both the social and biophysical sciences.

<sup>☆</sup>The paper was written by the lead author, based on background papers by the other authors listed above, and contributions from foresight workshop participants Awudu Abdulai, Deborah Balk, Derek Byerlee, Cheryl Doss, Ken Giller, Margaret McMillan, Clare Narrod, Gerald Nelson, Kei Otsuka, Carl Pray, Agnes Quisumbing, Bharat Ramaswami, Anita Regmi, Steve Staal, and Steve Wiggins. Many thanks are also due to Kenneth Cassman, Doug Gollin and Tim Kelley for guidance and suggestions from the ISPC, and to Dana Goldman and Nadira Saleh for assistance during the foresight workshop. A draft version of this synthesis was presented at the 7th meeting of the Independent Science and Partnership Council (ISPC) of the CGIAR on 25–27 March 2013 in Cali, Colombia.

\* Corresponding author. Tel.: +1 6176363751; fax: +1 6176363781.

E-mail address: [William.Masters@tufts.edu](mailto:William.Masters@tufts.edu) (W.A. Masters).

URL: <http://sites.tufts.edu/willmasters> (W.A. Masters).

By design, the foresight workshop aimed to elicit a wide range of views, which we seek to reconcile here. This synthesis paper is neither a summary of workshop proceedings, nor independent work. Instead, the synthesis is based entirely on data and concepts presented at the workshop and discussed afterwards, reconciling the participants' diverse views into a single narrative. The resulting synthesis is based entirely on workshop documents and discussion, but does not replace the five background papers each of which is available separately on the ISPC website.<sup>1</sup> Paper authors and workshop participants were deliberately selected to bring in diverse and often conflicting perspectives. This document does not repeat those divergent arguments, but provides an original synthesis from the first author's point of view.

## 2. Urbanization and rural population growth

Average farm sizes, in the sense of total land area per farmer, are ultimately dictated by a region's farm population. Total land area available for agriculture changes relatively little from year to year, and in developing countries most rural people are farming, so trend changes in average farm size are ultimately driven by changes in total population net of migration to towns and cities.

<sup>1</sup> All background papers and project details are available at [www.sciencecouncil.cgiar.org/sections/strategy-trends](http://www.sciencecouncil.cgiar.org/sections/strategy-trends).

Aggregate trends in the rural and urban population for Africa and Asia over the foresight study period are shown in Table 1.

Our focus is on the results shown above in bold, indicating continued high rates of growth in the rural population of Africa, with a decline in the rural population of Asia. These same data are used to illustrate year-to-year changes rural as opposed to urban populations in Fig. 1 of Jayne's background paper.

The UN urbanization estimates shown in Table 1 and Fig. 1 have been subject to great scrutiny by demographers such as workshop participant Balk (2013), often using geographic techniques as described in the background paper by Djurfeldt and Jirstrom (2013). Both Hazell and Jayne recognize that the way these estimates were constructed severely limits how they should be interpreted. In particular, the UN data are derived from national censuses in which the definition of "urban" or "rural" residence varies widely, so the densities cannot readily be compared across countries. There may also be systematic differences across continents in statistical procedures. As noted by Deborah Balk and by Andersson Djurfeldt and Jirstrom, taking account of increasingly accurate remote-sensing and geocoded survey data to count seasonal migrants, slum dwellers and the residents of smaller secondary towns and cities, it appears likely that Africa is actually more rural and less urbanized, relative to Asia, than these data suggest. In addition, Deborah Balk's workshop comments explained how these estimates rely on linear projections between census years, rather than structural demographic models. Taking account of gender and age-specific fertility, mortality and migration rates, it is likely that Africa's rural populations have actually grown more rapidly over time, relative to Asia's, than these data suggest.

Other data sources are not sufficiently comprehensive to replace the UN data shown in Table 1 and Fig. 1, but they do

indicate that these estimates are likely to be a conservative lower bound on the actual Asia–Africa differences in rural population growth and hence average farm sizes. Clearly, during the first three or four decades of CGIAR activity, both Africa and Asia experienced a gradual decline in the total land available per rural worker. There is great diversity within each continent, but long-term trends were driving the average farmer in both Africa and Asia to apply more labor on existing land, increasing the payoff from the development and adoption of labor-using, land-saving techniques such as new seeds and agronomic techniques. African farmers experienced much steeper declines in land per worker than Asian farmers, making year-to-year production growth per worker harder for them. Africa's distinctive demographic transition also involved much larger increase in child dependency ratios. Gender differences in responsibilities for both food supply and child care made these trends impose a particular burden on women, worsening the cost of unequal access to resources and market opportunities.

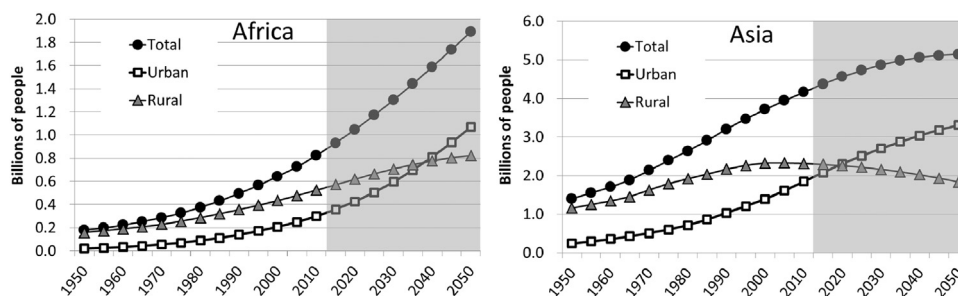
Looking ahead, the shaded area in Fig. 1 shows that rural population has reached its peak in Asia, but will continue to rise for several more decades in Africa. Some of this change is due to demographic structure, notably the rapid aging of Asia's rural populations relative to Africa's, and some of it is due to net migration. Local conditions across and within countries influence the exact timing of this turning point in rural population density, but the average Asian farm size already has or will soon begin to rise, as some rural households cultivate land released by neighbors whose workers have stopped farming. This rise in total land and other rural resources available per farmer, combined with the increased number and proximity of urban consumers, farm input suppliers and product marketing firms, ensures that the average farm size in Asian agriculture already or will soon involve increased output per farm and the kind of commercial dynamism described in detail by Reardon (2013) in his background paper, even as the average African farm size faces several more decades of worsening land scarcity as described by Thom Jayne.

Farm size trends at any given location may vary around the continent-wide trend, and that trend itself may not be precisely known, but the general direction of demographic change remains among the most predictable forces driving farmers' choice of technique and hence the agricultural research priorities of CGIAR centers and other public or private-sector organizations pursuing agricultural innovation. Across Asia, an increasing share of farm households have already or will soon experience an end to farm-size decline and begin to acquire larger areas, making it newly attractive for them to adopt land-using, labor-saving techniques with additional equipment and more capital per worker. In contrast, most of Africa will continue to experience falling average farm sizes for several more decades.

The predictability of these trends arises from demographic momentum and the persistence of age-specific mortality, fertility

**Table 1**  
Trends in rural and urban populations, 1970–2050, Africa and Asia.  
Source: Hazell, 2013, from UN data.

	Population (millions)				Average annual rate of change (%)		
	1970	2011	2030	2050	1970–2011	2011–2030	2030–2050
<i>Total population</i>							
Africa	368	1046	1562	2192	2.55	2.11	1.69
Asia	2135	4207	4868	5142	1.65	0.77	0.27
<i>Urban population</i>							
Africa	87	414	744	1265	3.82	3.09	2.65
Asia	506	1895	2703	3310	3.22	1.87	1.01
<i>Rural population</i>							
Africa	282	632	818	927	1.97	<b>1.35</b>	<b>0.63</b>
Asia	1629	2312	2165	1833	0.85	<b>-0.35</b>	<b>-0.83</b>



**Fig. 1.** Changes in rural, urban and total populations, 1950–2050.

Source: Adapted from Jayne, 2013 using data from United Nations (2012), World Urbanization Prospects: The 2011 Revision, online at <http://esa.un.org/unup>.

Download English Version:

<https://daneshyari.com/en/article/10502312>

Download Persian Version:

<https://daneshyari.com/article/10502312>

[Daneshyari.com](https://daneshyari.com)