



The New Global Frontier

Urbanization, Poverty and Environment in the 21st Century



Edited by George Martine, Gordon McGranahan, Mark Montgomery
and Rogelio Fernández-Castilla

The New Global Frontier

Urbanization, Poverty and Environment
in the 21st Century

Edited by
George Martine,
Gordon McGranahan,
Mark Montgomery and
Rogelio Fernández-Castilla

earthscan

publishing for a sustainable future

London • Sterling, VA

First published by Earthscan in the UK and USA in 2008
Copyright © IIED and UNFPA, 2008

All rights reserved

ISBN: 978-1-84407-559-1 hardback
978-1-84407-560-7 paperback

Typeset by JS Typesetting Ltd, Porthcawl, Mid Glamorgan
Printed and bound in the UK by MPG Books, Bodmin
Cover design by Susanne Harris

For a full list of publications please contact:

Earthscan

Dunstan House
14a St Cross Street
London EC1N 8XA, UK
Tel: +44 (0)20 7841 1930
Fax: +44 (0)20 7242 1474
Email: earthinfo@earthscan.co.uk
Web: www.earthscan.co.uk

22883 Quicksilver Drive, Sterling, VA 20166-2012, USA

Earthscan publishes in association with the International Institute
for Environment and Development

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

The new global frontier : urbanization, poverty and environment in the 21st century /
edited by George Martine ... [et al.].

p. cm.

Includes bibliographical references.

ISBN 978-1-84407-559-1 (hardback) – ISBN 978-1-84407-560-7 (pbk.) 1.
Urbanization—Economic aspects. 2. Urbanization—History—21st century. 3. Cities
and towns—Growth—History—21st century. 4. Urban economics—History—21st
century. 5. Poverty—History—21 century. I. Martine, George.

HT371.N475 2008

307.7609172'401--dc22

2008016058

The paper used for this book is FSC-certified.
FSC (the Forest Stewardship Council) is an
international network to promote responsible
management of the world's forests.



Mixed Sources

Product group from well-managed
forests and other controlled sources
www.fsc.org Cert no. SA-COC-1565
© 1996 Forest Stewardship Council

Contents

<i>List of boxes, figures and tables</i>	<i>ix</i>
<i>List of acronyms and abbreviations</i>	<i>xiii</i>
Introduction	1
PART I – URBAN TRANSITIONS	
1 The Demography of the Urban Transition: What We Know and Don't Know <i>Mark R. Montgomery</i>	17
2 Urbanization, Poverty and Inequity: Is Rural–Urban Migration a Poverty Problem, or Part of the Solution? <i>Cecilia Tacoli, Gordon McGranahan and David Satterthwaite</i>	37
3 Demographic and Urban Transitions in a Global System and Policy Responses <i>Ronald Skeldon</i>	55
PART II – SHELTER AND URBAN POVERTY	
4 Land and Services for the Urban Poor in Rapidly Urbanizing Countries <i>Gordon McGranahan, Diana Mitlin and David Satterthwaite</i>	77
5 Informality and Poverty in Latin American Urban Policies <i>Martim O. Smolka and Adriana de A. Larangeira</i>	99
6 Preparing for Urban Expansion: A Proposed Strategy for Intermediate Cities in Ecuador <i>Shlomo Angel</i>	115

- 7 Organizations of the Urban Poor and Equitable Urban Development:
Process and Product 131
Gabriella Y. Carolini

PART III – THE SOCIAL AND SUSTAINABLE USE OF SPACE

- 8 Urban Sustainability and Global Environmental Change: Reflections
for an Urban Agenda 149
Roberto Sánchez-Rodríguez
- 9 Risks of Climate Change for Urban Settlements in Low Elevation
Coastal Zones 165
Gordon McGranahan, Deborah Balk and Bridget Anderson
- 10 Urbanization and Ecosystems: Current Patterns and Future
Implications 183
Deborah Balk, Gordon McGranahan and Bridget Anderson
- 11 Urban Sprawl: A Challenge for Sustainability 203
Daniel Joseph Hogan and Ricardo Ojima

PART IV – THE CHANGING FACE OF URBAN DEMOGRAPHY AND ITS CHALLENGES

- 12 Notes on Urban–Rural Poverty Projections and the Role of
Migration 221
Ralph Hakkert
- 13 Women's Empowerment and Gender Equality in Urban Settings:
New Vulnerabilities and Opportunities 235
Luis Mora
- 14 Young People in an Urban World 247
Rogelio Fernandez Castilla, Laura Laski and Saskia Schellekens
- 15 Urbanization and Ageing in Developing Countries 259
José Miguel Guzmán and Paulo Saad
- 16 Confronting Urbanization and the AIDS Epidemic: A Double-Edged
Sword 271
Lynn Collins

- 17 Providing Information for Social Progress in Urban Areas 283
Haroldo da Gama Torres

**PART V – REGIONAL PATTERNS OF URBANIZATION AND
LINKAGES TO DEVELOPMENT**

- 18 African Urbanization: Recent Trends and Implications 301
Michael J. White, Blessing U. Mberu and Mark A. Collinson
- 19 Socioeconomic Heterogeneity in Urban India 317
S. Chandrasekhar and Abhiroop Mukhopadhyay
- 20 The Urban Transition in China: Trends, Consequences and Policy
Implications 335
Xuemei Bai
- 21 Urbanization in Latin America and the Caribbean: Experiences and
Lessons Learned 353
Jorge Rodriguez and George Martine
- Index* 369

List of Boxes, Figures and Tables

BOXES

2.1	From city centres to peripheral areas: Poor urban residents and marginalized settlements in Venezuela and Nigeria	44
4.1	Federations of the urban poor	92
7.1	Basic service provision by OUPs	134
7.2	Communities engaging in neighbourhood planning and improvement	137
9.1	Methodology for estimating urban and rural populations in the low elevation coastal zone	170

FIGURES

I.1	Percentage of the total population living in urban areas, by region, 1950–2030	5
I.2	Absolute increases in urban population by world regions, selected periods	5
I.3	Percentage of world urban population by size class of settlement, 1975–2015	6
1.1	Percentage of population living on less than US\$1.08 a day in rural and urban areas, developing countries	19
1.2	Urban population growth in more developed regions and less developed regions, 1950–2024	21
1.3	Total urban population by region, developing countries	22
1.4	Growth rates of total urban population by region, developing countries	23
1.5	Distribution of urban population by city size, developing countries in 2000	24
1.6	City growth rates for Seoul, Bangkok and Jakarta, 1950–2000	25
1.7	City population time series for Luanda, Angola	28

2.1	Projected growth in the world's population, 2005–2025	40
8.1	The interactions between urban areas and global environmental change: A conceptual framework	152
9.1	Urban extents and the LECZ in southern Viet Nam	171
9.2	The shares of urban centres intersecting the LECZ and of urban populations residing in the LECZ, by urban settlement size	175
10.1	Percentage of the population that is urban, shown by continent and ecological zone, 1990, 2000 and 2025 (projected)	189
10.2	Estimates of urban population in 2000, by continent and ecological zone	193
10.3	Percentage of urban population in 2000, by continent and ecological zone	194
10.4	Urban population density (persons per square kilometre) in 1995, by continent and ecological zone	195
10.5	Percentage change in urban population, 1990–2000, by continent and ecological zone	196
11.1	Schematic diagrams of urban form	209
14.1	Child dependency ratios in developing regions, 2005	249
14.2	Overall dependency ratios in developing regions, 2005	249
14.3	Evolution of overall dependency ratios in Africa, 1970–2010	250
15.1	Percentage of older persons by municipalities (communes) in Chile in the 2002 Census	266
18.1	Profile of permanent migration rates in the Agincourt subdistrict	305
18.2	Profile of temporary migration rates in the Agincourt subdistrict	305
19.1	Estimate of number of people living below poverty line	318
19.2	Male and female literacy rates in slum populations residing in different wards of the same municipal corporation	321
19.3	Male and female workforce participation rates in slum populations residing in different wards of the same municipal corporation	321
19.4	Distribution of households by monthly per capita expenditure class	327
19.5	Distribution of households by per capita area	327
20.1	Number of cities in China	336
20.2	Urbanization trend in China	337
21.1	Percentage urban of the total population in Latin American countries, 1950 and 2005	356

TABLES

1.1	Urban population forecast errors for 2000	29
1.2	Panel data city growth regression models, developing countries	31
2.1	Infant and under-five mortality rates in Kenya	41
2.2	Comparing the proportion of rural and urban populations that are below the poverty line	42

2.3	Rates of urbanization and urban growth in Africa, Asia and Latin America	45
3.1	Basic variables in the demographic and urban transitions, 1950–2025, world and major regions	56
6.1	Preliminary estimates of population and built-up area totals for regions, income groups and city size groups, 1990–2000	116
6.2	Preliminary estimates of average density and built-up area per person for regions, income groups and city size groups, 1990–2000	118
6.3	Populations, built-up areas and densities in five intermediate cities in Ecuador	120
6.4	Population, density, built-up area and urban area projections for 2030 for the five intermediate cities in Ecuador	121
6.5	The size distribution of rural properties in Canton Milagro	127
9.1	Population densities inside and outside LECZs, by region, 2000	172
9.2	Population and land area in the LECZ, by region, 2000	173
9.3	Ranking of countries with the largest urban population counts and shares in the low elevation coastal zone, 2000	174
9.4	Shares of urban centres intersecting the LECZ and shares of urban populations residing in the LECZ, by urban settlement size and region	175
9.5	Urban population counts and growth between 1990 and 2000 for China and Bangladesh, by total and in the LECZ	176
10.1	Underlying data sources and concepts	186
10.2	Share of the population that is urban, 2000 and 2025	190
10.3	Population in urban areas (millions) in 2000 and 2025	192
10.4	Percentage of total and urban land area and population in China in 2000	193
10.5	Average annual rate of change of the urban population, 1990–1995 and 1995–2025	197
12.1	Breakdown of changes in poverty rates among urban and rural areas	225
12.2	Estimated mean annual transition matrix, averaged over all sex and age groups for the 1999–2004 period	228
12.3	Birth, death, net migration and net mobility rates per 1000 population for the four population strata	228
12.4	Recent and projected population distributions averaged over all sex and age groups for the four population strata	228
12.5	Recent and projected population distributions adjusted to assume rural–urban migration flows reduced by 50%	229
15.1	Urbanization level and percentage of total, urban and rural populations aged 60 years and over at two points in time, by level of development and major area	261
18.1	Urbanization in sub-Saharan Africa's ten most populous countries	303
19.1	Proportion of households having access to basic services	323

19.2	Distribution of slums by change in condition of services	324
20.1	Rates of natural increase in, and migration to, the four largest Chinese cities (2004)	337
20.2	Major air pollutants by source	342
21.1	Growth of the urban and rural populations and evolution of urbanization levels: Latin America and the Caribbean, 1950–2030	354

Acronyms and abbreviations

APHRC	African Population and Health Research Center
AUWSP	Accelerated Urban Water Supply Programme (India)
BNH	Banco Nacional de Habitacao
BSUP	Basic Services to Urban Poor (JNNURM, India)
CEP	Centre for Economic Performance (LSE)
CIAT	International Centre for Tropical Agriculture
CIESIN	Center for International Earth Science Information Network
CODI	Community Organizations Development Institute (Thailand)
COHRE	Centre for Housing Rights and Evictions
CSH	Centre de Sciences Humaines (India)
DHS	Demographic and Health Survey
DSS	demographic surveillance systems
ECLAC	Economic Commission for Latin America and the Caribbean
ESCAP	Economic and Social Commission for Asia and the Pacific
EPZ	export processing zone
FAO	Food and Agricultural Organization of the United Nation
FDI	foreign development investment
GDP	gross domestic product
GEC	global environmental change
GIS	geographic information system
GRUMP	Global Rural-Urban Mapping Project
GTZ	German Technical Cooperation
IDSMT	Integrated Development of Small and Medium Towns (India)
IFPRI	International Food Policy Research Institute
IIED	International Institute for Environment and Development
ILO	International Labour Organization
INEC	Instituto Nacional de Estadística y Censos (Ecuador)
IPPF	International Planned Parenthood Federation
IT	information technology
JNNURM	Jawaharlal Nehru National Urban Renewal Mission (India)
LAC	Latin America and the Caribbean

LDC	least developed country
LDR	less developed region
LECZ	low elevation coastal zone
LSE	London School of Economics
MDG	Millennium Development Goal
MDR	more developed region
MICS	Multiple Indicator Cluster Survey
MIDUVI	Ministerio de Desarrollo Urbano y Vivienda (Ecuador)
MIPAA	Madrid International Plan of Action on Ageing
MPCE	monthly per capita expenditure
MSF	Médecins sans Frontières
NGO	non-governmental organization
NOAA	National Oceanic Atmospheric Administration
NIUA	National Institute of Urban Affairs (India)
NRCIM	National Research Council and Institute of Medicine
NSSO	National Sample Survey Organization (Government of India)
OAF	Fraternal Assistance Organization
OECD	Organisation for Economic Co-operation and Development
OUP	organization of the urban poor
PEVODE	People's Voice for Development (Tanzania)
SDI	socioeconomic and demographic information
SDI	Shack/Slum Dwellers International
SEDAC	Socioeconomic Data and Applications Center (GRUMP)
SERFHAU	Servico Federal de Habitacao e Urbanismo
SEWA	Self-Employed Women's Association (India)
SRTM	Shuttle Radar Topography Mission
SSA	sub-Saharan Africa
SUDENE	Superintendencia do Desenvolvimento do Nordeste
TSP	total suspended particulates
TVE	township and village enterprise
UHI	urban heat island
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UN-Habitat	United Nations Human Settlements Programme
UNRISD	United Nations Research Institute for Social Development
WCRC	Wartville Concerned Residents Committee (South Africa)
WFS	World Fertility Survey
WIDER	World Institute for Development Economics Research
WIEGO	Women in Informal Employment: Globalizing and Organizing
WPR	workforce participation rate

Preparing for Urban Expansion: A Proposed Strategy for Intermediate Cities in Ecuador¹

Shlomo Angel²

THE DYNAMICS OF GLOBAL URBAN EXPANSION AND ITS IMPLICATIONS

This chapter focuses on the provision of land for the urban poor in a context of rapid urban expansion. It describes a methodology and provides a concrete demonstration of how the land needs of the poor can be effectively met, using examples from five mid-sized cities in Ecuador.

A recent World Bank study (Angel et al, 2005) focused on the declining density of the built-up area in cities and the far-reaching implications of this in the face of continued urban growth. It provided, for the first time, tables and global estimates on the key parameters of urban expansion in developing countries. Preliminary estimates indicate that, if average densities continue to decline as they did during the 1990s, the built-up areas of cities of more than 100,000 people will increase from 200,000km² in 2000 to more than 600,000km² in 2030:

In other words, by 2030 these cities can be expected to triple their land area, with every new resident converting, on average, some 160 square metres of non-urban to urban land during the coming years. (Angel et al, 2005, p1)

Table 6.1 provides preliminary estimates of population and built-up area totals for regions and city size groups for two time periods, 1990 and 2000. The annual

Table 6.1 Preliminary estimates of population and built-up area totals for regions, income groups and city size groups, 1990–2000

Category	Urban population (>100,000)		Annual % Change	Built-up area (km ²)		Annual % Change
	1990	2000		1990	2000	
Developing Countries	1,394,533,000	1,665,035,000	1.8	145,800	206,900	3.6
Industrialized Countries	540,701,000	572,893,000	0.6	152,500	202,100	2.9
<i>Region</i>						
East Asia & the Pacific	336,214,000	410,903,000	2.0	21,900	43,900	7.2
Europe	350,776,000	353,722,000	0.1	66,600	81,400	2.0
Latin America & the Caribbean	234,459,000	288,937,000	2.1	33,700	42,600	2.4
Northern Africa	44,997,000	54,765,000	2.0	4500	5900	2.8
Other Developed Countries	337,202,000	367,041,000	0.9	120,800	159,600	2.8
South & Central Asia	278,205,000	332,207,000	1.8	15,500	24,200	4.6
South-East Asia	91,019,000	110,279,000	1.9	3600	6700	6.4
Sub-Saharan Africa	180,735,000	227,930,000	2.3	19,100	28,800	6.1
Western Asia	81,627,000	92,142,000	1.2	12,700	15,800	2.2
<i>City Population Size</i>						
100,000–528,000	585,330,000	655,294,000	1.1	98,300	136,300	3.3
528,000–1,490,000	482,319,000	539,682,000	1.1	63,300	90,400	3.6
1,490,000–4,180,000	449,160,000	547,268,000	2.0	65,400	90,600	3.3
More than 4,180,000	418,423,000	495,685,000	1.7	71,400	91,700	2.5
Total	1,935,233,000	2,237,928,000	1.5	298,300	409,000	3.2

Source: Angel et al (2005) Table IV-1, p55, based on weighted averages of the 90-city sample.

growth in population and built-up area in Latin America and the Caribbean were 2.1 per cent and 2.4 per cent respectively. The annual growth in population and built-up area in lower-middle-income countries such as Ecuador were 2.0 per cent and 5.4 per cent respectively; the annual growth in population and built-up area in cities with populations between 100,000 and 528,000 were 1.1 per cent and 3.3 per cent respectively.

Table 6.2 provides preliminary estimates of average density and built-up area per person for regions and city size groups for the same two time periods. Average densities in Latin America and the Caribbean changed from 6955 persons per km² in 1990 to 6785 per km² in 2000, an annual decrease of 0.3 per cent. Average densities in cities with populations between 100,000 and 528,000 changed from 5955 persons per km² in 1990 to 4810 per km² in 2000, an annual decrease of 2.1 per cent. The implications of these findings are challenging:

It is of the utmost importance to all stakeholders – be they ordinary citizens or planners and decision-makers in the public, private or civic sectors – to ensure that adequate quantities of public goods are put in place in a timely fashion, before it is too late; that there are adequate lands for absorbing the expected population growth; that there is an adequate capacity of urban trunk roads than can carry public transport; that there are adequate supplies of drinking water and effective means of sewage disposal; that sensitive lands are protected from development; and that there is effective protection of open space. None of these are likely to be provided at adequate levels without concerted public action. (Angel et al, 2005, p73)

The conclusion arrived at by Angel et al is unambiguous: cities that experience population and economic growth will also need to prepare for expansion of their urban perimeters:

This in itself is an important finding, because it is quite common to hear of urban planners and decision makers speaking of their cities as exceptions to the rule, asserting that other cities will grow and expand and their city will not, simply because it is already bursting at the seams, and because they think that further growth is objectionable. ... The key issue facing public-sector decision-makers – at the local, national and international levels – is not whether or not urban expansion will take place, but rather what is likely to be the scale of urban expansion and what needs to be done now to adequately prepare for it. (Angel et al, 2005, p90)

Table 6.2 Preliminary estimates of average density and built-up area per person for regions, income groups and city size groups, 1990–2000

Category	Average built-up area density (persons/km ²)			Average built-up area per person (m ² per person)		
	1990	2000	Annual	1990	2000	Annual
			% change			% change
Developing Countries	9560	8050	-1.7	105	125	1.7
Industrialized Countries	3545	2835	-2.2	280	355	2.3
<i>Region</i>						
East Asia & the Pacific	15,380	9350	-4.9	65	105	5.1
Europe	5270	4345	-1.9	190	230	1.9
Latin America & the Caribbean	6955	6785	-0.5	145	145	0.3
Northern Africa	10,010	9250	-0.8	100	110	0.8
Other Developed Countries	2790	2300	-1.9	360	435	2.0
South & Central Asia	17,980	13,720	-2.7	55	75	2.7
South-East Asia	25,360	16,495	-4.2	40	60	4.4
Sub-Saharan Africa	9470	6630	-3.5	105	150	3.6
Western Asia	6410	5820	-1.0	155	170	1.0
<i>City Population Size</i>						
100,000–528,000	5955	4810	-2.1	170	210	2.2
528,000–1,490,000	7620	5970	-2.4	130	165	2.5
1,490,000–4,180,000	6870	6040	-1.3	145	165	1.3
More than 4,180,000	5860	5405	-0.8	170	185	0.8
Global Average	6485	5470	-1.7	155	185	1.7

Source: Angel et al (2005) Table IV-2, p57, based on weighted averages of the 90-city sample.

URBAN GROWTH AND EXPANSION IN ECUADOR

Most of the larger intermediate cities in Ecuador are growing rapidly and are expected to double (or more than double) their populations and triple (or more than triple) their built-up areas in the next 25 years. Five intermediate cities in the country are the focus of this chapter. They have not been selected for study because of any particular attribute, other than the fact that they are cities in developing countries that are presently experiencing rapid growth. The author visited these cities in an exploratory mission for the World Bank in late 2005 to examine possible strategies for ensuring that affordable land for housing the poor remains in ample supply in the coming years. The cities visited were Eloy Alfaro Durán, a rapidly growing outer suburb of Guayaquil; Milagro, an agricultural-export centre about an hour east of Guayaquil; Santo Domingo, a transport hub in the centre of the country; Sangolqui, an outer suburb of Quito; and Riobamba, a provincial centre on the Andean plateau, half way between Quito and Guayaquil. In all five cities, the author interviewed municipal officials, mostly from the cadastre, planning, public works and finance departments, obtained documents and maps, and visited settlements on the urban periphery.

At present, there is no shortage of affordable plots for the urban poor in these intermediate cities. Most residential plots are currently supplied by private landowners or developers who subdivide and sell minimally serviced land and, to a lesser extent, by land invasions. However, to ensure that residential land for the urban poor will remain affordable, municipalities must make certain that accessible urban land remains in ample supply in the coming years, so that land prices will not be subject to speculative increases. To meet this challenge, municipalities must actively prepare for urban expansion by:

- expanding their city limits;
- planning for an arterial infrastructure grid – in the order of 800–1000 metres in width – in the areas of expansion;
- employing the services of highway engineers to locate the required 25–30-metre-wide right of way for the infrastructure grid on the ground; and
- obtaining the land rights for the right-of-way of the entire arterial grid, using available laws while minimizing unilateral expropriation.

This chapter provides the background and the rationale for pursuing this strategy at the present time.

There are four aspects of the pattern of urban growth in Ecuador that merit attention: the urban–rural balance, the distribution of the urban population, urban growth rates and the distribution of urban growth.

In 2003, for example, only 61.8 per cent of the Ecuadorian population lived in cities, compared with 76.8 per cent in Latin America and the Caribbean and

81.1 per cent in South America as a whole. In South America, only Guyana and Paraguay were less urbanized than Ecuador. Indeed, Ecuador is still a rural country compared to most other South American countries, relying as it does on agriculture as its main export: 57 per cent of all exports in 2003 were of agricultural products (ITC, undated).

The distribution of the urban population in Ecuador is highly skewed towards the larger cities. In 2001, of a total urban population of 7.0 million in cities with 10,000 or more people, 48.5 per cent resided in the two primate cities – Guayaquil (2.0 million) and Quito (1.4 million). Thirteen secondary cities with populations between 100,000 and 300,000 housed an additional 30.2 per cent of this population (2.1 million), while 31 tertiary cities with populations between 20,000 and 100,000 housed an additional 15.6 per cent (1.0 million). Cities with populations between 10,000 and 20,000 people housed only 390,000 people, or 5.5 per cent of the total (INEC, 2001, Tables 2 and 4).

While declining, the urban growth rate in Ecuador is still the fourth highest in South America, at 2.3 per cent between 2000 and 2005. Urban growth continued to account for almost all population growth in the country. Primary cities in Ecuador grew at a slower rate than smaller cities – 2.4 per cent per annum between 1990 and 2001, when the average annual growth rate in each of the other city size groups was in the order of 3.1 per cent per annum. One city, Eloy Alfaro Durán, grew very rapidly, at a rate of more than 7 per cent per annum; if continued, this rate would *double* its population in a single decade.

Table 6.3 provides population, built-up area and density figures for the five intermediate cities studied. Sangolquí, the smallest of the five, is a relatively rich and low-density suburb of Quito, with no informal settlements or invasions. Milagro is the only city with a reported population growth rate lower than two per cent,

Table 6.3 *Populations, built-up areas and densities in five intermediate cities in Ecuador*

City	Population 1990	Population 2001	Annual growth (%)	Population 2006	Urban area (km ²)	Built-up area (km ²)	Density ³ (persons per km ²)
Sangolquí	35,386	56,794	4.30	70,104	32	19	3664
Milagro	93,637	113,440	1.74	123,684	30	21	5816
Riobamba	94,505	124,807	2.53	141,403	29	17	8177
Eloy Alfaro Durán	82,359	174,531	6.83	242,821	59	29	8273
Santo Domingo	114,422	199,827	5.07	255,871	73	44	5863

Sources: Population data for 1990 and 2001 are from the census; the 2006 population estimates were obtained by linear extrapolation of census data; urban area and built-up area estimates are from interviews in municipalities.

although municipality officials and a recent cadastre, which found 50,000 occupied residential properties, dispute this census figure.

Since none of the five intermediate cities studied here was in the global sample of cities analysed by Angel et al (2005), gross estimates were made of the current built-up areas of these cities, while the parameters of the global study were used only to estimate their future growth. Table 6.4 provides population, density, built-up area and urban area projections for 2030. These projections were based on the assumptions that: urban population growth in Ecuador will decline between 2000 and 2030 at the rates estimated by the United Nations (2004); the share of the urban population in these five cities will grow at the same rate as it did between the two latest census periods (0.15 per cent per annum); built-up area densities will decline at a rate of 2 per cent per annum; the population of Milagro was underestimated and was in the order of 150,000, and not 113,000, in 2001; and the urban limits will encompass one-third more area than the built-up area, to account for open space and vacant lands.

Preliminary estimates suggest that, by 2030, Eloy Alfaro Durán, Santo Domingo, Milagro and Sangolqui will require a *threefold* increase in their present urban areas to accommodate their projected population and built-up area increases. Riobamba will require a *doubling* of its urban area. This expansion will require the conversion of adequate lands from rural to urban use on the periphery of these cities. In all five cities examined, the officially designated limits of the urban area will have to be expanded to accommodate the projected increase in the built-up areas.

Table 6.4 *Population, density, built-up area and urban area projections for 2030 for the five intermediate cities in Ecuador*

City	Population	Density	Built-up area	Urban area	Growth ratios 2005–2030			
	2030	2030	2030	2030	Population	Density	Built-up area	Urban area
Sangolqui	140,850	2211	64	85	2.0	0.6	3.3	2.7
Milagro	251,773	3510	72	96	2.0	0.6	3.4	3.1
Riobamba	195,611	4935	40	53	1.4	0.6	2.3	1.8
Eloy Alfaro Durán	635,466	4993	127	170	2.6	0.6	4.3	2.9
Santo Domingo	569,138	3538	161	214	2.2	0.6	3.7	2.9

Source: Based on data in Table 6.3.

Note: Areas measured in km² and density in people per km².

ACCESS TO RESIDENTIAL LAND FOR THE URBAN POOR IN ECUADOR

In general, it appears that there are no shortages of *raw* land for residential development in Ecuadorian cities at the present time (Jarrin, 1997). It is abundantly clear, however, that there are serious shortages of *serviced* urban land for low-income housing in the formal sector, with the result that a great share of land subdivision and sale takes place in the informal sector – either through land invasions or through informal land subdivisions which do not conform to zoning and subdivision regulations. The prevalence of invasions varies considerably from city to city. There were no invasions in Santo Domingo, for example, in 2005 and 2006, while there were five invasions (and no formal land subdivisions) in Milagro in 2006 alone.

The availability of land for informal-sector housing varies from city to city, as do land prices. In some secondary cities on the coast, for example, more than 70 per cent of residential land is under informal sector occupation, compared to only 25 per cent for secondary cities in the sierra (MIDUVI, 1994, Table 6, p15). In Quito, raw land in illegal subdivisions sold for US\$4/m² in 2000, partially serviced land in established informal settlements sold for US\$15–25/m², land for middle-income housing sold for US\$50–60/m², and land in upper-income, fully serviced subdivisions sold for US\$100/m² or more. There are still numerous illegal subdivisions where cheap land can be found within the city limits.

To reach *below-median* households in Ecuador at the present time, serviced or partially serviced plots should cost US\$1660–3300⁴ – in other words US\$14–28/m² for a 120m² plot or US\$8–17/m² for a 200m² plot. To reach the lowest 20 per cent of the income-earning households, serviced or partially serviced plots should cost US\$660–1330 – in other words US\$6–11/m² for a 120m² plot or US\$3–7/m² for a 200m² plot. These numbers help explain why the informal sector continues to be the main supplier of residential land for the poor. They also explain, in stark terms, the challenge facing the formal sector in going downmarket to develop progressive urbanizations that can effectively compete with what the informal sector now offers.

In the five intermediate cities studied, unserviced land prices in informal settlements were somewhat higher than those observed on the outskirts of Quito in 2000, but were still affordable by the lowest income decile. In Milagro, for example, the average price in an illegal subdivision was US\$8/m², or US\$960 for an 8 metre by 15 metre plot. In Santo Domingo, the average price in an illegal subdivision was US\$10/m², and plots of 120m² were sold for US\$1200, payable at US\$20 per month for five years at the local savings bank (Caja de Ahorros). In Riobamba, plots without services in illegal subdivisions sold for US\$4/m².

Compared to other countries, a very high percentage of the urban households in Ecuador live in unauthorized housing communities without legal title documents.

In 1994, 48.1 per cent of the urban population in Ecuador lived in marginal settlements and 34.7 per cent of the urban population did not have legal tenure (MIDUVI, 1994, Tables 6 and 7). This compares with a value of 25 per cent for cities in Latin America and the Caribbean, 16 per cent for lower-middle-income countries and 4 per cent for the world as a whole (Angel, 2000, p328).

In Quito, the population in marginal settlements – mostly informal land subdivisions and not invasions – amounted to 30 per cent and the population without legal land titles to 18 per cent. In other cities of the sierra, the population in marginal settlements amounted to 25 per cent and the population without legal tenure to 13 per cent. In Guayaquil, the population in marginal settlements amounted to 60 per cent and the population without legal tenure to 45 per cent. Illegal invasions of private lands, with political support, have been going on in the city for 60 years. In other cities on the coast, 70 per cent of households lived in marginal settlements, and 56 per cent did not have legal title documents (MIDUVI, 1994, Tables 6 and 7, pp15–16).

The absence of legal title documents continues to impede housing market transactions at full value, to prevent the use of the house as collateral for loans, to limit investment in house improvements, to diminish residential mobility, to give rise to property-related disputes, to prevent effective property taxation, and to create an overall environment of illegitimacy and disrespect for the law (World Bank, 1998). Titles, on the other hand, increase the value of houses, although it is not exactly clear by how much. A recent study of the effect of titling on the house values of 400 families in Guayaquil concluded that informal property rights in older communities can effectively substitute for formal titles: thus it makes more sense to focus on titling in young, disorganized communities (Lanjouw and Levy, 1998).

Data on the quality of residential infrastructure is also available from the 1990 and 2001 censuses (INEC, 2001). In 2001, 96.6 per cent of all urban homes in Ecuador had electricity, compared with 95.4 per cent in 1990; 84.6 per cent had a water connection on their plot, compared with 75.8 per cent in 1990; 66.6 per cent had piped sewage disposal, compared with 61.6 per cent in 1990; 64.5 per cent had garbage collection services, compared to 69.0 per cent in 1990; and 43.7 per cent had telephones, compared with 24.7 per cent in 1990 (INEC, 1990 and 2001, Table 2). Water rates for those dwellings with a water connection varied between US\$0.06 and US\$0.30/m³, as against US\$1.80/m³ for water delivered by truck, but many of those with a permanent water connection experienced an irregular water supply. In most intermediate cities, a large percentage of the roads in residential communities were unpaved. In Milagro, for example, 61 per cent of roads were paved with laterite and 21 per cent not paved at all.

There is a clear need to extend better infrastructure services to the urban population and especially to poor families living in marginal settlements. People are willing to pay for better basic services – water, sewerage, drainage and paved roads – in these settlements. In Riobamba, for example, the municipality, in

partnership with several communities, is negotiating a loan with a commercial bank for upgrading infrastructure.

Municipalities are presently burdened with the obligation of providing residential infrastructure for their residents but are seriously lacking in adequate resources to meet this obligation. Water shortages are especially acute, and two municipalities – Santo Domingo and Eloy Alfaro Durán – have initiated large water purification projects with international loans. Large numbers of roads remain unpaved, and there is virtually no sewerage and minimal sewage treatment in low-income residential communities. Improving the quality of infrastructure in the years to come will hinge on enlisting the collaboration of communities as well as their monetary contributions. This will take time, and, for now, while the poor can afford to settle on minimally serviced lands, they cannot expect a full complement of urban services to be present when they first occupy the land. Municipal services are likely to be provided gradually, as funds and loans become available, and will hinge on the ability of municipalities (or private-sector intermediaries) to recover a substantial portion of the full cost of providing these services.

MAKING MINIMUM PREPARATIONS FOR URBAN EXPANSION

The problem of access to land for the urban poor in the intermediate cities of Ecuador is largely a longer-term problem affecting the city as a whole. As accessible urban land around these cities becomes scarcer, land prices are likely to rise, making building sites unaffordable for the poor. Keeping housing affordable requires keeping land prices affordable. This implies that there needs to be an adequate supply of urban land so that land speculation is kept to a minimum and land prices remain affordable. If municipal governments can ensure that there is a viable land market on the urban fringe of cities, then they can stay out of the direct acquisition of land for affordable housing, or sites and services of any kind, and let the market offer land at affordable prices for all segments of society, including the poor.

This, in turn, requires that municipal governments provide the *public goods* necessary for a well-functioning urban land market on the fringe of cities. They must ensure that there is an adequate amount of land for urban use, a basic arterial infrastructure network and a regulatory framework to ensure ordered development of this land in line with municipal objectives. The latter requires the development of new regulations and procedures that are negotiated and agreed upon between municipalities and private-sector informal developers, so as to ensure that informal subdivisions are better planned and that a minimum amount of urban services are provided. There will be an effort to transform these informal developers into 'social urbanizers', utilizing recent experiences from Brazil, Colombia and El Salvador. Possible collaboration between municipalities and informal developers may involve the provision of training in project layout, the certification of urbanizers, and the provision of lines of credit or subsidies for infrastructure.

Developers or communities typically plan (and later develop) *tertiary* infrastructure networks at the city-block level within land subdivisions. At the national level, central governments act to plan and provide *primary* inter-city roads and rail transport. The arterial or *secondary* road system within cities, however, is a public good that is typically under-supplied. It is this road system that is also the location of trunk infrastructure services – water mains, sewers and storm drains, and cable and telephone networks. It is also the road network that serves public bus transport and provides the right of way for light rail transport. It is usually the responsibility of municipalities to ensure that a connected network of such arterial roads is properly planned and developed as the city expands outwards.

The main reason that the secondary road system is under-supplied is what is known in economics as the 'free rider' problem. The cost of tertiary roads within land subdivisions is typically included in the price of the land and is recovered when the land is sold to its future occupants. Primary roads are typically financed by central government budgets and as of late, part of their cost is recovered from tolls. Municipalities typically provide secondary roads free of charge, and their cost cannot be recovered from tolls. Secondary roads are classic public goods and their cost needs to be recovered, to the extent possible, from property taxes or from general taxation. Given the very limited budgets of municipalities and their limited ability to borrow funds, it is of utmost importance, therefore, to minimize the cost of bringing the secondary road network into being.

If municipalities wait too long before acquiring land for secondary roads, it becomes too expensive to acquire. Clearly, once land subdivisions spring up haphazardly and land is occupied, it is virtually impossible to introduce new secondary roads, and they remain in permanently short supply. It is of prime importance, therefore, to secure the right of way for such an arterial infrastructure network far in advance of development, when land prices are still low and when there is little or no need for the demolition of structures of any kind.

What is needed is the early acquisition of the right of way for an entire network of roads that will serve the projected urban area. Two parameters are particularly important here: (a) the width of these rights of way will need to be in the order of 25–30 metres and (b) the roads will need to be spaced in the form of an *urban grid*⁵ some 800–1000 metres apart, so that people can walk to a bus stop from any location within the urban area in less than 10 minutes. This means that the road network will enclose 'super blocks' of an average size of 60–100 hectares. These super blocks will, in turn, contain road networks that serve individual subdivisions, neighbourhoods, and commercial, industrial and civic areas, as well as parks and open spaces.

Urban grids of arterial roads can be found in a number of cities around the world. However, in order to support public transport that is within walking distance of any interior location in a super block, the grid spacing cannot exceed one kilometre. The projected densities in the five cities studied – 3500 to 5000 people per square kilometre (except for the city of Sangolqui) – are all above the

thresholds required for a bus system or, more generally, for a public-transit-oriented urban lifestyle (Holtzclaw, 1994).

The organization of urban expansion within new city limits – with super blocks that form a rectangular grid, a connected set of radial and peripheral roads, or something in between – will advance the ordered development of the urban territory. This does not mean that there will not be a need for more detailed zoning, land-use planning, or regulations concerning density and building codes, however. All it will do is provide an underlying organization for the orderly expansion of the city. It will provide municipal planners with a key tool for organizing future development and a starting point for more comprehensive city planning. For once, they will be ahead of those subdividing land rather than trailing them.

The acquisition of the right of way for the entire network of arterial roads carrying trunk infrastructure will distribute access to land throughout the urban fringe, preventing the speculation that typically occurs when the number of roads is in short supply. It will also act to unify the city and to prevent the formation of large and isolated low-income neighbourhoods. The placement of the right of way of roads is expected to modestly increase land values beyond the present rural land values of US\$1–6/m², and this will increase property taxes. But the increase in price is likely to be relatively limited, given the large amount of land that will be brought into the urban land market. It is expected that the municipalities will be able to repay the cost of acquisition through the increase in property taxes in the rural periphery as a result of the project.

Preparing cities for expansion with an urban grid also empowers municipalities to direct development away from lands that should remain undeveloped because of their sensitive habitat, because of their value as open space, or because of the dangers of landslides or floods. It will still not prevent development in areas designated as open space, however, if municipalities do not delimit these areas, reduce the amount of land to be protected to a minimum and then apply aggressive measures to protect it from development. Such measures may include fencing and guarding the lands or bequeathing the land to civic organizations that could protect them with campaigns and volunteers. Simply declaring lands as open space not to be developed is unlikely to be an effective enough measure where most development takes place illegally or informally.

All of the cities studied, with the possible exception of Riobamba, have large haciendas on the urban periphery. However, available cadastral data for the rural areas surrounding the city of Milagro, summarized in Table 6.5, shows that the average size of rural properties is only 5.6 hectares and the average size of small rural properties is 2.7 hectares. In Canton Durán, to take another example, the average size of rural properties is 12.7 hectares. There is, therefore, no need to apply complicated procedures such as *land readjustment* to obtain land for roads and primary infrastructure networks. The Ecuadorian law pertaining to the acquisition of land for public use allows for acquiring up to 10 per cent of each property for public use as a servitude without pay. It also allows for using up to 35 per cent of

Table 6.5 *The size distribution of rural properties in Canton Milagro*

Size Range (hectares)	Number of properties	Average size (hectares)	Total area (hectares)	Percentage of total
0-10	6566	2.47	16,243.38	39.2
10-50	801	18.59	14,892.50	35.9
>50	65	158.34	10,292.34	24.8
Total Canton	7432	5.57	41,428.22	100.0

Source: Municipality of Milagro, Cadastral Department (2006).

each parcel for public purposes once the land is developed, and this land can be reserved in advance by marking a lien on its title. The proportion of land that needs to be expropriated for a 30-metre right-of-way grid at a one-kilometre spacing is 6 per cent; for an 800-metre grid spacing it is 7.5 per cent. It has been estimated by several cadastral directors that the majority of the right of way in each city could be acquired without pay and without forced expropriation.

What are the possible risks of pursuing this strategy of preparing these cities for urban expansion at the present time? One possible risk is that municipalities, swamped with short-term commitments and obligations, will not be willing to devote sufficient manpower, resources or political capital for pursuing this project. This is a serious risk, of course, but the indications from the author's visit to these municipalities are that there is a great deal of willingness to carry it out. All of the cities have new administrations that are keen to make their mark and new mayors who are interested in a broad vision of their cities. They would lend substantial support to the project, particularly if it can be implemented during their terms of office.

A second possible risk is that the enlargement of the urban boundaries and the marking of the rights of way of roads will provide a signal to the real estate market that the city will grow and expand, and that consequently this will lead to speculation and to a substantial rise in land prices. Indeed there is surely going to be some rise in land prices, as well there should be. But increases are likely to be moderate, because a very large area will be added to the city, and because speculative pressures on land prices at the present time are very low. Executing the project in five cities is likely to see different results in different cities, and it will be important to study these results with the aim of explaining the variations in land price increases between them. All cities have now completed (or almost completed) maps of current land values that will act as baseline data for a future study of the effects of the project on land values.

A third possible risk is that the increases in the availability of land on the urban periphery will have the opposite effect – that of lowering land prices, thereby leading to development at lower densities. This is unlikely to happen. Land prices are quite low at the present time, and densities of development are not far from global norms.

Finally, a fourth possible risk is that the cost estimates for the expropriation of lands for the rights of way are inaccurate, and that the actual costs will be much higher. To address this, it may be necessary to obtain a better estimate, with a local study of these projections. All these risks must be properly assessed before moving ahead with the proposed strategy, but they do appear to be manageable.

CONCLUDING REMARKS

Although this chapter should be understood as an interim report on work in progress, it has shown that a practical strategy aimed at ensuring that access to land for the urban poor in the intermediate cities in Ecuador remains ample and affordable is possible. There is a serious commitment on the part of officials in all the municipalities visited to pursue this strategy vigorously in the months and years to come. Municipal officials from two more intermediate cities – Machala and Manta – have now joined the initiative. Officials from these seven municipalities met with international and local experts, including the author, for a workshop on this subject. They have started to delimit new expansion areas based on preliminary population and built-up area projections, planning the arterial road networks in the new expansion areas, refining legal tools for acquiring the rights of way for the arterial road networks, and estimating the budgets needed for implementation. There is no doubt among the great majority of participating municipal officials (with the possible exception of those in Sangolqui) that this is a strategy with a potentially high rate of return on investment.

The strategy should be an attractive one for visionary mayors and can be carried out with a relatively low amount of investment *if it is carried out early enough*. It is also an important demonstration project for a large number of cities in developing countries that now face strong population pressures. Given the scale of upcoming urban growth in other developing countries, particularly in Asia and Africa, and given the large share of poor people in that growth, the need for such strategies appears critical.

NOTES

- 1 This chapter is based on a recent World Bank study on the global dynamics of urban expansion and a follow-up mission to Ecuador to help design a strategy for responding to that expansion. All opinions, findings or inaccuracies herein are the sole responsibility of the author and do not reflect the views, policies or practices of the World Bank.
- 2 The author wishes to thank Fernando Argüello, Monica Quintana and Rodrigo Torres for their support and suggestions.
- 3 Density is measured as a ratio of the population to the built-up area, not the 'urban area' (the administrative area within the city limits).

- 4 Assuming that the income distribution now is the same as it was in 2000 and that the cost of land forms up to a third of total house and land price.
- 5 For a description of the main characteristics and advantages of this kind of grid, see Farvaque-Vitkovic and Godin (1998).

REFERENCES

- Angel, S. (2000) *Housing Policy Matters: A Global Analysis*, Oxford University Press, New York
- Angel, S., Sheppard, S. C. and Civco, D. L. (2005) *The Dynamics of Global Urban Expansion*, Transport and Urban Development Department, World Bank Washington, DC, available at http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/dynamics_urban_expansion.pdf, last accessed 27 September 2007
- Farvaque-Vitkovic, C. and Godin, L. (1998) *The Future of African Cities: Challenges and Priorities for Urban Development*, World Bank Report No 18408, World Bank, Washington, DC, pp103–104
- Holtzclaw, J. (1994) 'Using residential patterns and transit to decrease auto dependence and costs', Natural Resources Defense Council, New York, quoted in A. Bertaud (2002) 'Clearing the air in Atlanta: Transit and smart growth or conventional economics', Table 1, p9, http://alain-bertaud.com/images/AB_Clearing_The_Air_in%20Atlanta_1.pdf, last accessed 27 September 2007
- INEC (1990) *V Censo de Población y de Vivienda*, Instituto Nacional de Estadística y Censos, Quito
- INEC (2001) *VI Censo de Población y de Vivienda*, Instituto Nacional de Estadística y Censos, Quito
- ITC (undated) 'Comparison of Ecuador's export statistics with those of partner countries, by product group, for 2003', International Trade Centre, based on COMTRADE data of the United Nations Statistical Division, www.intracen.org/countries/structural05/ecu_8.pdf, last accessed 27 September 2007
- Jarrín, A. M. (1997) 'Ecuador: Removiendo obstáculos críticos para la provisión de vivienda', *Urbana Consultores*, 3 April, Quito
- Lanjouw, J. O. and Levy, P. I. (1998) 'Untitled: A study of formal and informal property rights in urban Ecuador', Center Discussion Paper No 788, Economic Growth Center, Yale University, New Haven, CT
- MIDUVI (1994) 'Política nacional de desarrollo urbano, vivienda y saneamiento ambiental', Ministerio de Desarrollo Urbano y Vivienda, Quito
- United Nations (2004) *World Urbanization Prospects: The 2003 Revision*, Population Division, United Nations, New York
- World Bank (1998) 'Project appraisal document on a proposed loan in the amount of US\$60.7 million to Venezuela for a Caracas slum-upgrading project', Report No 17924, World Bank, Washington, DC