

Malawi - An Atlas of Social Statistics

**National Statistical Office,
Government of Malawi**

**International Food Policy
Research Institute**

NATIONAL STATISTICAL OFFICE

The National Statistical Office (NSO) of the government of Malawi was established after independence in 1964 and operates through the 1967 Statistics Act for the collection, compilation, analysis, abstraction and publication of statistical information on a wide range of topics. The mission of the National Statistical Office is to provide and promote accurate, appropriate, high quality, and timely statistical information for use in both the public and the private sectors for policy formulation, decision-making, research and general public awareness for the advancement of the socio-economic status of all Malawians. The NSO headquarters are in Zomba, with regional office in Blantyre, Lilongwe, and Mzuzu.

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The mission of the International Food Policy Research Institute (IFPRI) is to identify and analyze policies for sustainably meeting the food needs of the developing world. Research at IFPRI concentrates on economic growth and poverty alleviation in low-income countries, improvement of the well-being of poor people, and sound management of the natural resource base that supports agriculture. IFPRI seeks to make its research results available to all those in a position to use them and to strengthen institutions in developing countries that conduct research relevant to its mandate.

IFPRI researchers have worked in Malawi since the late-1980's, supporting policymakers, non-governmental organizations, and civil society in their efforts to help the poor and malnourished. The work presented in this document emanates from IFPRI's programme of technical assistance to the Malawi Poverty Monitoring System undertaken between 1998 and 2001.

ROCKEFELLER FOUNDATION

This atlas was published with the financial assistance of the Rockefeller Foundation, which is a knowledge-based, global foundation with a commitment to enrich and sustain the lives and livelihoods of poor and excluded people throughout the world. This atlas is a product of the Foundation's efforts to support activities aimed at informing policy development, program design and resource allocation by providing local level, multifaceted information on food, work, health and other human conditions that are needed to understand and address the root causes of poverty.

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Malawi

An Atlas of Social Statistics

Todd Benson

with James Kaphuka, Shelton Kanyanda and Richmond Chinula



**National Statistical Office
Government of Malawi**

Zomba

Malawi



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acknowledgement to the National Statistical Office, Government of Malawi, and the International Food
Policy Research Institute.

Cover photographs by E. Payongayong and the author.

Printed in South Africa.

Library of Congress Cataloging-in-Publication Data

Benson, Todd David.

Malawi : an atlas of social statistics / Todd Benson.
p. cm.

Includes bibliographical references.

ISBN 0-89629-714-4 (alk. paper)

1. Malawi-Social conditions-Statistics. 2. Malawi-Economic
conditions-Statistics. 3. Malawi-Population-Statistics. I.
International Food Policy Research Institute. II. Title.

HN807.A85 B45 2002
306'.096897'021--dc21

2002007716

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PREFACE

The National Statistical Office of the government of Malawi was established to collect, compile, analyze, publish, and disseminate statistical information on a wide range of topics. The mission of the National Statistical Office is to provide and promote accurate, appropriate, high-quality, and timely statistical information for use in both the public and the private sectors for policy formulation, decision making, research, and general public awareness for the advancement of the socio-economic status of all Malawians.

A central focus of the work of the NSO is the living conditions of all Malawians - especially the poor, whose standard of living fails to meet their basic needs. This atlas was developed as part of efforts to increase our understanding of the living conditions of Malawi's poor as a basis for action to better provide for their well-being. Taken in their entirety, the maps in this atlas provide profound insights into the characteristics and living conditions of the population of Malawi and how they vary across the country, thereby enabling poverty reduction programs and policies to be appropriately targeted. It is our wish that all those working for poverty reduction and economic and social development in Malawi will find this atlas to be an important information source in designing strategies to direct our nation toward a brighter future.

The maps are drawn principally from the results of the 1998 Population and Housing Census for which NSO was responsible; however, data from other sources was also exploited, most notably the 1997-98 Integrated Household Survey. We gratefully acknowledge the institutions that provided technical and financial support in carrying out the 1998 census: the United Nations Population Fund, the Department for International Development of the government of the United Kingdom, the United Nations Development Programme, and the United States Agency for International Development. NSO further thanks the inter-ministerial Technical Working Committee of the Poverty Monitoring System for the guidance and support provided to NSO in carrying out the 1997-98 Integrated Household Survey.

Charles Machinjili
Commissioner for Census and Statistics
National Statistical Office
Government of Malawi

FOREWORD

International Food Policy Research Institute (IFPRI) researchers have worked in Malawi since the late-1980s, supporting policymakers, non-governmental organizations (NGOs), and civil society in their efforts to help the poor and malnourished. The work presented in this atlas emanates from IFPRI's program of technical assistance to the Malawi Poverty Monitoring System undertaken between 1998 and 2001.

A key function of the Poverty Monitoring System is to provide policymakers with the information they need to formulate and implement policies that will benefit Malawi's poor. This work provides politicians, civil servants, members of non-governmental and civil organizations, economic and social researchers, and donors with basic information on the living conditions of Malawians that is necessary to construct appropriate policies and programs. While the information presented here will not be sufficient in itself, future policies must be grounded in a fundamental understanding of the conditions of life in Malawi, and the maps in this atlas significantly contribute to this understanding.

The mission of the International Food Policy Research Institute is to identify and analyze policies for sustainably meeting the food needs of the developing world. While our research efforts are geared to the precise objective of contributing to the reduction of hunger and malnutrition, the factors involved are many and wide-ranging, requiring analysis of underlying processes and extending beyond a narrowly defined food sector. The production of this atlas in collaboration with our colleagues at the National Statistical Office of Malawi is fully in line with our mission as an institution. I hope the atlas will assist others who share our goal of reducing hunger and poverty in Malawi by facilitating the targeting and the design of interventions for maximum effect on permanently alleviating the suffering of the hungry and the poor.

Per Pinstруп-Andersen
Director-General
International Food Policy Research Institute

ACKNOWLEDGEMENTS

I am particularly grateful to the National Statistical Office staff who collected and processed most of the data used in developing this atlas. My thanks to the Commissioner for Census and Statistics, Mr. Charles Machinjili, and to his deputy, Mrs. Mercy Kanyuka, for their facilitation of the creation of this atlas. The 1998 Census was the responsibility of the Demography and Social Statistics Division at NSO, led by Mr. Jameson Ndawala. I thank him along with Mr. James Kaphuka of the same division for their assistance in providing the census data and guiding me in its use. Mr. Shelton Kanyanda and Mr. Richmond Chinula, statisticians at NSO, made important contributions to the poverty mapping analysis of the 1997-98 Malawi Integrated Household Survey (IHS), for which I am grateful. Finally, Mr. Kenneth A. Tchuwa of the Cartography division was always helpful in compiling the base maps necessary for the atlas.

Several colleagues at the International Food Policy Research Institute played important roles in the development of this atlas. Mr. Nik Harvey courageously undertook the desktop publishing of this document. I am particularly grateful for his attention to detail and his willingness to take on unfamiliar tasks. Evelyn Banda, Mary Jane Banks, and Joan K. Stephens provided necessary support in the planning and oversight, editing, and graphic design of the atlas, respectively. My thanks to all.

Without the efforts of Mr. Geoffrey C. Mzembe of the District and National Land Management Mapping Project of the Department of Surveys in converting the paper maps from the NSO into digital format for use with geographic information system software, this atlas would never have been created. He has played and continues to play a key role in the development of digital spatial datasets for Malawi. My thanks to Mr. A. F. Tambala and Mr. Khanjilawaya of the Malawi Electoral Commission for providing the boundary descriptions for the local government wards. In assembling the maps for the atlas, I benefited from the work of Dr. Cynthia A. Brewer of Pennsylvania State University - her Color Brewer on-line color selection tool allowed me to evaluate alternative legend color schemes, while the atlas she published with Trudy A. Suchan, *Mapping Census 2000: The Geography of U.S. Diversity*, provided a good example to emulate. Last but not least, my thanks go to the Rockefeller Foundation and to Dr. John Lynam of the Foundation for providing financial support for the development of this atlas.

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This atlas provides an extensive set of maps at a relatively disaggregated, localized level on the social condition of the people of Malawi over the past five years. Each map page presents statistics on the population at the level of the rural traditional authority (TA) or the urban administrative ward. There are about 350 populated TAs and wards in the country, so considerably more detail is presented in these maps than would be possible using the same statistics at the much larger district or regional levels. Figure 1 below shows the breakdown of the various rural and urban spatial groupings used in Malawi and found in this atlas.

The majority of the information presented here is derived from the Malawi Population and Housing Census carried out in September 1998 by the National Statistical Office (NSO). Table 1 below presents the individual and household population figures from this census for each TA or ward. A copy of the household questionnaire used in the census is presented in Annex 1. The national census is a wonderful data set in that it covers all individuals in the population. However, with such a broad scope it must be standardized and simple to administer, so the amount of information collected is limited. Nevertheless, as we hope most readers will agree, it does provide important insights to guide the country's development efforts.

Information from other sources is also presented. The Malawi Integrated Household Survey (IHS) of 1997-98 was used with the census data to develop maps of poverty for the country. Information from other sources on the location of health centers, educational facilities, Malawi Social Action Fund (MASAF) projects, Agricultural Development and Marketing Corporation (ADMARC) depots, and improved roads is also used to develop maps on the relative access of the population to these components of the social and economic infrastructure of Malawi. Finally, agricultural production estimates are used to develop two sets of maps on the cropping patterns and productivity of smallholder farmers.

The intended audience for this atlas is Malawians engaged in policymaking - that is, those involved in addressing the large economic and social development challenges Malawi faces. It is our desire, however, that all citizens and engaged non-citizens will recognize their own role in policymaking. In the developing democracy of Malawi, policy decisions will be made by an increasingly wider body of individuals than in the past. Consequently, this atlas is being distributed not only to key individuals in government, but also to parliamentarians, district assemblies, non-governmental and civil organizations, economic and social researchers, educational institutions, and donors. It is in everyone's interest that those involved in the policymaking process have as much information as possible as they debate Malawi's future development possibilities. Of central importance to informing policymakers is the provision of this atlas to educational institutions - both universities and secondary schools: Today's students will be tomorrow's policymakers, and this atlas provides a foundational understanding of living conditions across the country.

Considerations of poverty in Malawi motivate the content of this atlas. The atlas is itself an out-growth of work done as part of the activities of the government's Poverty Monitoring System. Chapter 3 wholly focuses on measures of poverty, and the subject matter in most of the other maps can be correlated to the poverty status of the population for each of the areas mapped. Readers are strongly encouraged to make direct comparisons between the maps of poverty measures with the other maps in the atlas to investigate to what degree poverty may or may not be reflected in the spatial patterns of these other maps.

Text accompanying the maps is quite brief, primarily because of limited space. The aim was to provide sufficient information to define the statistic being mapped, describe the broad spatial patterns shown in the maps, and highlight possible pitfalls in interpreting the maps. Considerably more interpretation is possible; the atlas will have succeeded if it leads others to pose new questions and to conduct new research on what accounts for the living conditions of Malawians and how their lives might be enhanced.

Finally, some notes on the maps themselves are needed:

1. Most of the maps are shaded-area maps. The colors used represent different data-value ranges. A TA will be mapped with a particular color if the statistic for that TA falls within the data-value range corresponding to that color.
2. Most maps have a six-category, two-color legend scheme, usually three shades of green and three shades of orange. The statistical bounds of the legend categories were chosen so that relatively equal numbers of TAs and wards would fall into each category; however, the color shift from green to orange occurs at the national value for the statistic being mapped. Simply by considering the color pattern, one can quickly assess which areas of the country are characterized by disproportionately high or low values for the statistic. Closer examination of the shades of color used will provide more detailed information on the spatial distribution of the statistic.

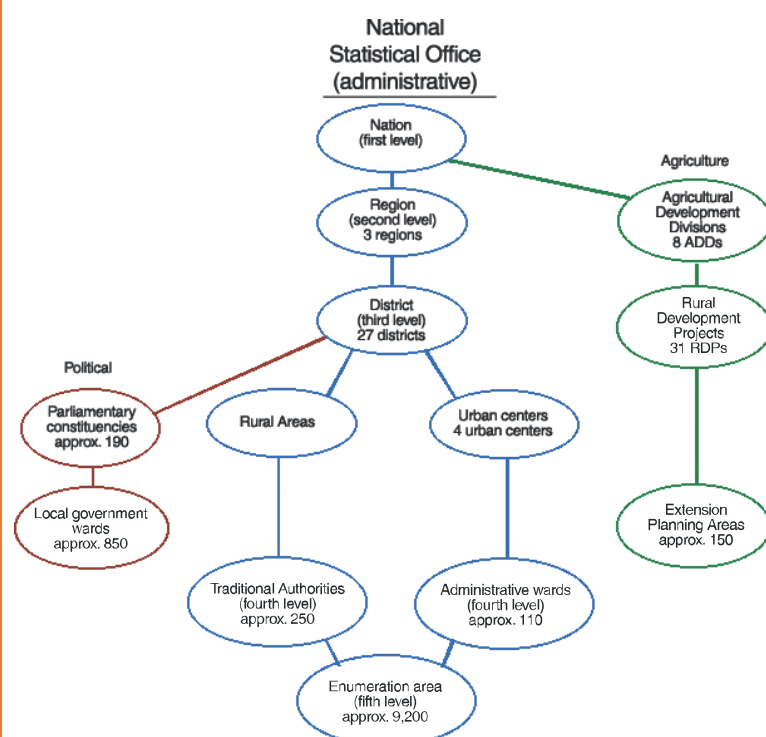
- In most instances, green shading is used for statistical values that are judged to be socially desirable, while orange shading is used for those areas performing relatively poorly for the statistic being mapped. For example, areas with high literacy rates are shown in green shades, while areas with low literacy rates relative to the nation as a whole are shown in orange. For those statistics for which it is difficult to judge what might be socially desirable, an alternative color scheme to green and orange is used.
- Unless otherwise indicated, the main map on each page presents data at the TA and ward-level, while smaller maps show the spatial pattern of the mapped statistics for a) the administrative wards of the four urban centers and b) the districts. The district maps are provided as a simplified view of the national spatial distribution of the statistic and to allow the map reader to assess how important within-district variation of the statistic might be.
- For most maps of the variables from the census, areas with less than 100 households are left blank. This is done to respect the confidentiality of the information that households in these areas provided the NSO in the census. For such areas, individual characteristics are more readily seen in the aggregate statistics presented than is the case for more populous areas.

The base maps for *Malawi: An atlas of social statistics* were originally drawn by the staff of the cartography section of the National Statistical Office by updating maps from the earlier 1987 census with field reports from 1998 census mapping teams. Mr. K.A. Tchuwa led this effort. Most of these maps were drawn at the 1:50,000 scale or at more detailed scales. Mr. G. C. Mzembe of the District and National Land Management Mapping Project of the Department of Surveys digitized these paper maps, creating digital map shapefiles. Over 9,200 enumeration areas were used to organize data collection efforts for the 1998 census. The TA and ward maps were derived from the enumeration area shapefiles.

The base module and the spatial analyst module of the ArcView 3.2 geographic information and mapping software package produced by ESRI Inc. were used to create the maps. The maps were exported to Quark Xpress as PostScript files for final desktop publishing.

While care has been taken in mapping and in labeling, the boundaries and names shown on the maps do not imply an official endorsement or acceptance of the same on the part of the government of Malawi.

FIGURE 1: ORGANIZATION OF SPATIAL HIERARCHIES USED IN MALAWI



Several spatial organization schemes are used in Malawi, and several of them appear in this atlas. Most maps in the atlas are based on the spatial organization the National Statistical Office has established to collect its data. This geography follows that of the administrative structure of the country - regions, districts, and traditional authorities or administrative wards. Traditional authorities are found in the rural areas, while administrative wards are found in the four urban centers of Blantyre, Lilongwe, Mzuzu, and Zomba. The enumeration area (EA) forms the basic, foundational unit for the NSO. Whereas districts, traditional authorities, and administrative wards are commonly used by other institutions and by government, EAs are not typically used by other institutions than the NSO. Each level of this spatial organization respects the boundaries of the level above it. That is to say, any one district is only in one region, any one TA is only in one district, and any one EA is only in one TA.

The poverty chapter of this atlas includes maps of local government wards. This is a political unit developed in the late-1990s for local government purposes. Any one local government ward is only in one district, but, although considerably smaller than TAs, the local government wards do not always respect TA boundaries, but can cross them. Consequently, the local government wards do not neatly fit into the NSO spatial organization of the country.

Likewise, information gathered at the level of the agricultural Extension Planning Area (EPA) is also included in this atlas. The data collection system of the Ministry of Agriculture follows the design of its agricultural extension system. There are eight Agricultural Development Divisions covering the country. These tend to respect regional and district boundaries, but not in all cases. EPAs are generally slightly larger than TAs. While TA boundaries are often respected in delimiting EPAs, this is not always possible. Consequently, this system also does not fit neatly into the NSO spatial organization.

TABLE 1- INDIVIDUAL AND HOUSEHOLD POPULATION FOR EACH TA AND ADMINISTRATIVE WARD FROM 1998 CENSUS

Area Name	Population	Households	Area Name	Population	Households
MALAWI	9,933,868	2,273,837	Muzilawayingwe Ward	2,779	603
<i>Northern Region</i>	<i>1,233,560</i>	<i>243,060</i>	Chasefu Ward	1,596	275
Chitipa District	126,799	25,748	Katawa Ward	2,876	610
TA Mwabulambya	49,443	10,000	Masasa Ward	1,175	235
TA Mwenemisuku	22,970	4,819	Kaning'ina Ward	3,701	646
TA Mwenewenya	13,650	2,700	Viphya Ward	6,752	1,427
TA Nthalire	18,660	3,575	Msongwe Ward	1,540	268
TA Kameme	14,419	3,099	New Airport Site	3,733	731
Nyika NP-Chitipa	21	6	Likoma District	8,074	1,527
Chitipa Boma	7,636	1,549	TA Mkumpha	8,074	1,527
Karonga District	194,572	39,880	<i>Central Region</i>	<i>4,066,340</i>	<i>908,943</i>
TA Kilupula	47,445	10,024	Kasungu District	480,659	96,787
SC Mwakaboko	15,377	3,645	TA Kaluluma	29,823	5,768
TA Kyungu	46,063	9,554	SC Simlemba	23,241	4,305
TA Wasambo	37,725	6,979	SC M'nyanja	19,346	3,408
SC Mwirang'ombe	20,151	4,066	SC Chisikwa	4,636	851
Nyika NP-Karonga	0	0	TA Kaomba	31,943	6,623
Karonga Town	27,811	5,612	SC Lukwa	26,397	5,666
Nkhata Bay District	164,761	33,374	SC Kawamba	40,537	7,858
TA Kabunduli	30,130	6,718	SC Njombwa	24,539	5,184
TA Fukamapiri	11,287	2,225	SC Chilowamatambe	30,196	5,995
TA Malenga Mzoma	8,441	1,622	TA Chulu	43,327	7,861
SC Malanda	16,767	3,215	TA Santhe	64,544	13,007
SC Zilakoma	10,229	2,198	TA Wimbe	73,954	15,778
TA Mankhambira	17,118	3,474	TA Kapelula	21,866	4,535
SC Fukamalaza	7,867	1,271	TA Mwase	18,171	4,009
SC Mkumbira	7,653	1,588	Kasungu NP	385	98
TA Musisya	12,851	2,332	Kasungu Boma	27,754	5,841
SC Nyaluwanga	5,239	962	Nkhotakota District	229,460	50,031
SC Mkondowe	1,677	331	TA Kanyenda	74,932	15,647
TA Timbiri	24,911	5,258	SC Kafuzila	11,995	2,812
TA Boghoyo	1,158	245	TA Malenga Chanzi	41,501	9,401
Nkhata Bay Boma	9,433	1,935	SC Mphonde	18,767	4,111
Rumphi District	128,360	25,353	TA Mwadzama	45,997	10,226
TA Chikulamayembe	45,510	9,170	SC Mwansambo	16,918	3,589
TA Mwamlowe	7,356	1,188	Nkhotakota GR	88	17
SC Mwahenga	9,822	2,011	Nkhotakota Boma	19,262	4,228
SC Mwalweni	16,209	3,138	Ntchisi District	167,880	35,947
SC Kachulu	6,709	1,290	TA Kasakula	10,895	2,567
SC Chapinduka	2,389	427	TA Chikho	19,568	4,290
SC Mwankhunikira	13,203	2,635	TA Kalumo	66,998	14,144
TA Katumbi	9,206	1,872	SC Nthondo	17,103	3,680
TA Zolokere	3,156	583	SC Chilooko	47,543	10,182
Nyika NP- Rumphi	516	111	Ntchisi Boma	5,773	1,084
Vwaza Marsh GR-Rumphi	215	32	Dowa District	411,387	90,379
Rumphi Boma	14,069	2,896	TA Dzoole	53,902	11,384
Mzimba District	524,014	98,571	SC Chakhaza	93,813	19,951
TA M'Mbelwa	85,470	14,486	SC Kayembe	61,484	13,256
TA Mtwalo	99,230	19,888	TA Chiwere	61,773	14,427
SC Kapingo Sibande	38,370	7,426	SC Mkukula	52,524	12,196
SC Jaravikuba Munthali	10,314	2,066	TA Msakambewa	48,159	10,662
TA Chindi	94,250	18,451	SC Mponela	25,393	5,695
TA Mzikubola	49,709	8,285	Dowa Boma	4,493	844
TA Mabulabo	45,905	8,250	Mponela Urban	9,846	1,964
SC Khosolo Gwaza Jere	26,045	5,013	Salima District	248,214	58,491
TA Mpherembe	37,413	7,785	TA Maganga	35,688	7,958
TA Mzukuzuku	23,194	4,065	TA Karonga	42,498	9,484
Vwaza Marsh GR-Mzimba	372	77	TA Pemba	15,440	3,940
Mzimba Boma	13,742	2,779	SC Kambwiri	20,117	4,636
Mzuzu City	86,980	18,607	TA Ndingi	27,190	6,710
Nkhorongo Ward	2,385	465	SC Kambalame	10,590	2,619
Lupaso Ward	10,084	2,169	TA Khombedza	45,765	11,269
Zolozolo Ward	6,687	1,370	SC Mwanza	12,609	2,871
Chiputula Ward	15,867	3,617	TA Kuluunda	9,372	2,261
Chibanja Ward	6,440	1,490	SC Msosa	4,418	1,211
Mchengautuwa Ward	16,112	3,742	Lake Malawi NP-Salima	186	55
Katoto Ward	3,920	715	Salima Town	20,355	4,526
Jombo Ward	1,333	244	Chipoka Urban	3,986	951

TABLE 1 - (CONTINUED)

Area Name	Population	Households	Area Name	Population	Households
Lilongwe Rural	905,889	209,536	Area 53	11,947	2,534
TA Chadza	79,900	19,173	Area 54	3,469	898
TA Kalolo	104,939	23,457	Area 55	10,867	2,687
TA Chiseka	173,468	40,371	Area 56	22,369	5,698
TA Mazengera	75,018	18,358	Area 57	34,692	8,244
SC Chitekwele	26,750	6,632	Area 58	16,893	3,800
TA Khongoni	76,121	15,954	Mchinji District	324,941	70,792
TA Chimutu	64,236	15,403	TA Mlonyeni	27,181	5,659
TA Chitukula	21,900	4,824	SC Mavwere	68,202	15,006
SC Mtema	35,652	7,648	TA Zulu	63,054	13,483
TA Kalumbu	44,519	11,321	SC Mduwa	58,363	12,070
SC Tsabango	19,627	4,885	TA Mkanda	61,454	13,949
TA Kalumba	17,739	4,289	SC Dambe	35,214	7,993
SC Njewa	22,044	4,891	Mchinji Boma	11,473	2,632
TA Malili	63,445	14,895	Dedza District	486,682	113,544
TA Kabudula	80,531	17,435	TA Pemba	105,343	24,681
Lilongwe City	440,471	98,406	SC Chilikumwendo	46,282	11,165
Area 1	10,922	2,201	TA Kaphuka	103,622	24,253
Area 2	2,774	540	TA Tambala	51,711	12,179
Area 3	4,658	1,094	SC Chauma	16,389	4,009
Area 4	42	2	TA Kasumbu	56,115	12,841
Area 5	225	34	TA Kachindamoto	68,092	16,041
Area 6	1,365	66	SC Kamenya Gwaza	23,720	5,097
Area 7	31,686	7,005	Dedza Boma	15,408	3,278
Area 8	23,310	5,116	Ntcheu District	370,757	85,030
Area 9	1,529	430	TA Phambala	47,238	11,041
Area 10	3,987	956	TA Mpando	37,275	7,868
Area 11	1,075	315	TA Kwataine	35,322	8,093
Area 12	2,629	517	SC Makwangwala	66,339	15,159
Area 13	37	3	SC Champiti	13,584	3,183
Area 14	861	175	TA Njolomole	45,867	10,269
Area 15	1,872	278	TA Chakhumbira	21,685	4,944
Area 16	0	0	SC Goodson Ganya	77,078	18,576
Area 17	0	0	TA Masasa	17,586	4,014
Area 18	10,677	1,767	Ntcheu Boma	8,783	1,883
Area 19	0	0			
Area 20	0	0	<i>Southern Region</i>	<i>4,633,968</i>	<i>1,121,834</i>
Area 21	35,314	7,746	Mangochi District	610,239	151,316
Area 22	19,622	3,979	TA Mponda	87,426	20,754
Area 23	33,664	7,000	TA Chimwala	87,024	21,020
Area 24	13,602	3,250	TA Nankumba	79,419	19,248
Area 25	39,132	8,184	TA Jalasi	58,406	15,358
Area 26	3,892	1,008	SC Mbwana Nyambi	59,695	15,009
Area 27	1,434	378	SC Chowe	83,204	20,878
Area 28	321	61	TA Katuli	47,106	12,540
Area 29	658	114	TA Makanjila	47,919	12,298
Area 30	2,914	486	SC Namabvi	22,721	5,910
Area 31	0	0	Lake Malawi NP- Mangochi	0	0
Area 32	247	48	Mangochi Town	26,570	5,915
Area 33	1,938	151	Monkey Bay Urban	10,749	2,386
Area 34	0	0	Machinga District	369,614	90,138
Area 35	5,176	859	TA Liwonde	63,798	15,247
Area 36	16,164	4,013	SC Sitola	31,488	7,578
Area 37	0	0	TA Kawinga	84,648	20,570
Area 38	2,591	626	SC Chamba	16,526	3,876
Area 39	3,886	1,081	SC Mposa	17,655	4,551
Area 40	0	0	SC Mlomba	28,045	7,073
Area 41	0	0	SC Chikweo	39,108	9,748
Area 42	0	0	SC Ngokwe	20,476	5,153
Area 43	1,651	391	SC Chiwalo	12,101	2,878
Area 44	13,203	3,205	TA Nyambi	38,593	9,407
Area 45	414	61	Liwonde NP	206	43
Area 46	2,244	500	Machinga Boma	1,269	293
Area 47	5,497	1,098	Liwonde Town	15,701	3,721
Area 48	0	0	Zomba Rural	480,746	120,425
Area 49	13,501	2,728	TA Kuntumanji	61,076	14,928
Area 50	8,178	2,016	TA Mwambo	96,106	24,378
Area 51	14,499	4,411	SC Mkumbira	5,074	1,269
Area 52	2,843	652	TA Chikowi	45,650	11,329

TABLE 1 - (CONTINUED)

Area Name	Population	Households	Area Name	Population	Households
SC Mbiza	108,967	28,112	TA Mluli	17,153	4,174
TA Mlumbe	116,283	29,152	TA Kanduku	23,735	5,496
TA Malemia	47,590	11,257	TA Nthache	31,296	7,397
Zomba Municipality	65,915	14,944	TA Symon	25,130	5,985
Mbedza Ward	3,246	770	TA Ngozi	13,133	3,049
Mtiya Ward	10,176	1,705	Majete GR-Mwanza	117	25
Masangola Ward	1,732	396	Mwanza Boma	8,189	1,837
Chikamveka Ward	2,542	605	Thyolo District	458,976	112,135
Chikamveka North Ward	8,851	2,211	TA Nsabwe	28,417	6,177
Chirunga East Ward	4,324	1,046	SC Thukuta	11,771	2,836
Chirunga Ward	1,591	368	SC Mbawela	31,072	6,811
Likangala Ward	9,575	2,659	TA Changata	27,960	6,522
Zakazaka Ward	5,417	1,144	SC Mphuka	36,021	9,207
Zomba Central Ward	2,684	485	SC Kwethemule	37,016	9,391
Chambo Ward	4,310	757	TA Kapichi	39,642	9,286
Sadzi Ward	5,722	1,413	TA Nchilamwela	52,187	14,350
Likangala Central Ward	4,822	1,136	TA Chimaliro	83,281	20,317
Likangala South Ward	923	249	TA Bvumbwe	72,643	17,839
Chiradzulu District	236,050	58,529	TA Thomas	24,811	6,152
TA Mpama	46,914	11,675	Thyolo Boma	5,313	1,098
TA Likoswe	46,527	11,160	Luchenza Town	8,842	2,149
TA Kadewere	62,198	15,754	Mulanje District	428,322	103,973
TA Nkalo	34,381	8,555	TA Mabuka	133,118	30,919
TA Chitera	15,789	3,944	SC Laston Njema	50,181	13,040
TA Nchemba	27,542	6,862	TA Chikumbu	60,466	13,535
Chiradzulu Boma	2,699	579	TA Nthiramanja	34,688	8,581
Blantyre Rural	307,344	74,860	TA Nkanda	76,056	19,420
TA Kapeni	73,055	17,570	SC Juma	61,207	15,582
TA Lundu	20,184	5,276	Mulanje Mountain Reserve	58	11
TA Chigaru	33,243	8,249	Mulanje Boma	12,548	2,885
TA Kunthembwe	26,703	6,810	Phalombe District	231,990	59,292
TA Makata	13,656	3,384	TA Mkhumba	152,909	38,845
TA Kuntaja	64,025	15,678	TA Nazombe	76,503	19,827
TA Machinjili	21,430	5,147	Phalombe Boma	2,578	620
TA Somba	55,048	12,746	Chikwawa District	356,682	79,074
Blantyre City	502,053	120,923	TA Ngabu	114,336	22,245
Michiru Ward	28,303	7,149	TA Lundu	42,511	10,157
South Lunzu Ward	24,366	5,140	TA Chapananga	64,993	14,806
Mapanga Ward	17,265	4,990	TA Maseya	19,216	4,442
Nkolokoti Ward	23,703	5,941	TA Katunga	16,429	3,975
Ndirande North Ward	20,009	5,066	TA Kasisi	25,362	6,340
Ndirande South Ward	61,638	15,281	TA Makhwira	59,022	14,055
Ndirande West Ward	13,795	3,300	Lengwe NP	304	49
Nyambadwe Ward	7,272	1,787	Majete GR-Chikwawa	59	11
Likhubula Ward	48,966	12,632	Chikwawa Boma	7,474	1,648
Chilomoni Ward	23,223	5,131	Ngabu Urban	6,976	1,346
Blantyre West Ward	18,458	4,477	Nsanje District	194,924	43,491
Blantyre Central Ward	3,668	925	TA Ndamera	23,550	5,298
Blantyre East Ward	3,578	368	TA Chimombo	8,844	1,947
Chichiri Ward	5,708	1,163	TA Nyachikadza	4,366	1,003
Mzedi Ward	9,177	2,107	TA Mlolo	47,663	11,098
Bangwe Ward	35,723	8,761	TA Tengani	25,076	5,731
Namiyango Ward	13,367	3,212	SC Mbenje	34,254	7,508
Limbe East Ward	32,780	8,388	TA Malemia	16,009	3,340
Limbe Central Ward	2,558	583	TA Ngabu	9,094	2,109
Limbe West Ward	10,865	1,952	SC Makoka	5,037	1,024
Soche East Ward	14,793	2,566	Mwabvi GR	4,044	784
Soche West Ward	33,453	7,337	Nsanje Boma	16,987	3,649
Nancholi Ward	10,876	2,740	Balaka District	253,098	60,557
Misesa Ward	18,893	5,135	TA Nsamala	145,048	34,410
Chigumula Ward	17,002	4,030	TA Kalembo	93,752	22,969
Msamba Ward	2,614	762	Balaka Town	14,298	3,178
Mwanza District	138,015	32,177			
TA Dambe	19,262	4,214			

TA Traditional authority.

SC Sub-chief (Historically, sub-chiefs governed under the authority of the local traditional authority. The sub-chieftdoms are used in order to create reasonably sized administrative units within large TAs.)

NP National park.

GR Game reserve.

Boma District administrative headquarters.

Urban Urbanized areas within rural districts.

Town Urbanized areas within rural districts.

Ward Administrative ward - the urban equivalent of a rural traditional authority or sub-chief area.

Area Numbered administrative wards in Lilongwe city.

Malawi

Administrative districts

Malawi 2002

As of 2002, Malawi had 27 administrative districts in three regions. With the exception of Likoma, all are named for the district's administrative headquarters or *boma*. Likoma district consists of the group of islands in the Mozambican waters of Lake Malawi, administered by Malawi, and is named for the largest island in the group. The four urban centers of Malawi - Lilongwe, Mzuzu, Blantyre, and Zomba - are not separate districts, but are treated separately in most of the maps in this atlas where district-level information is presented.

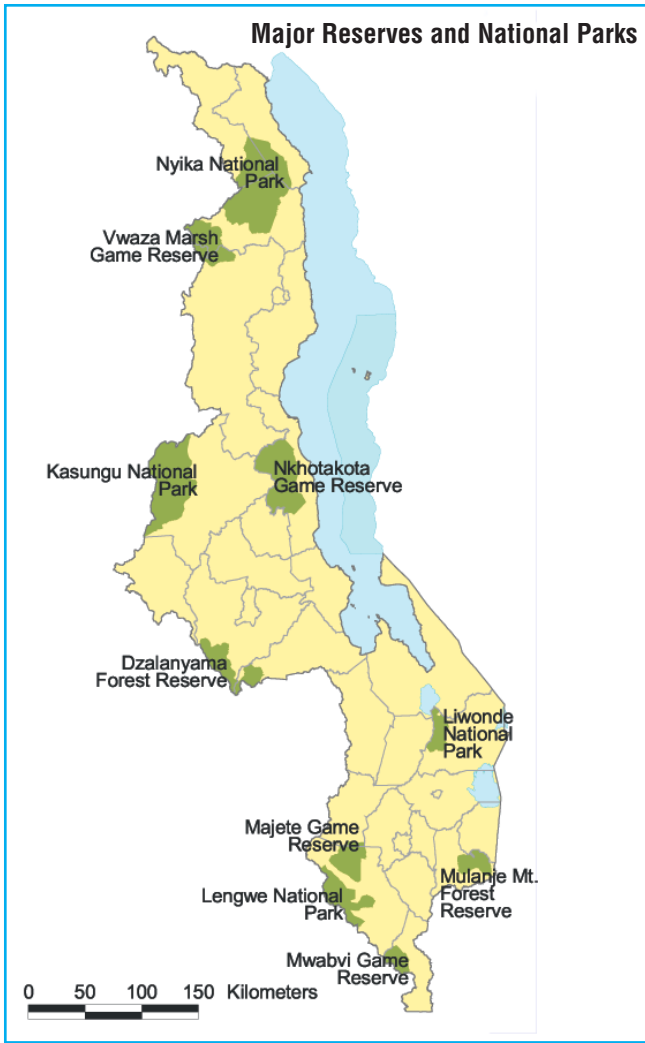
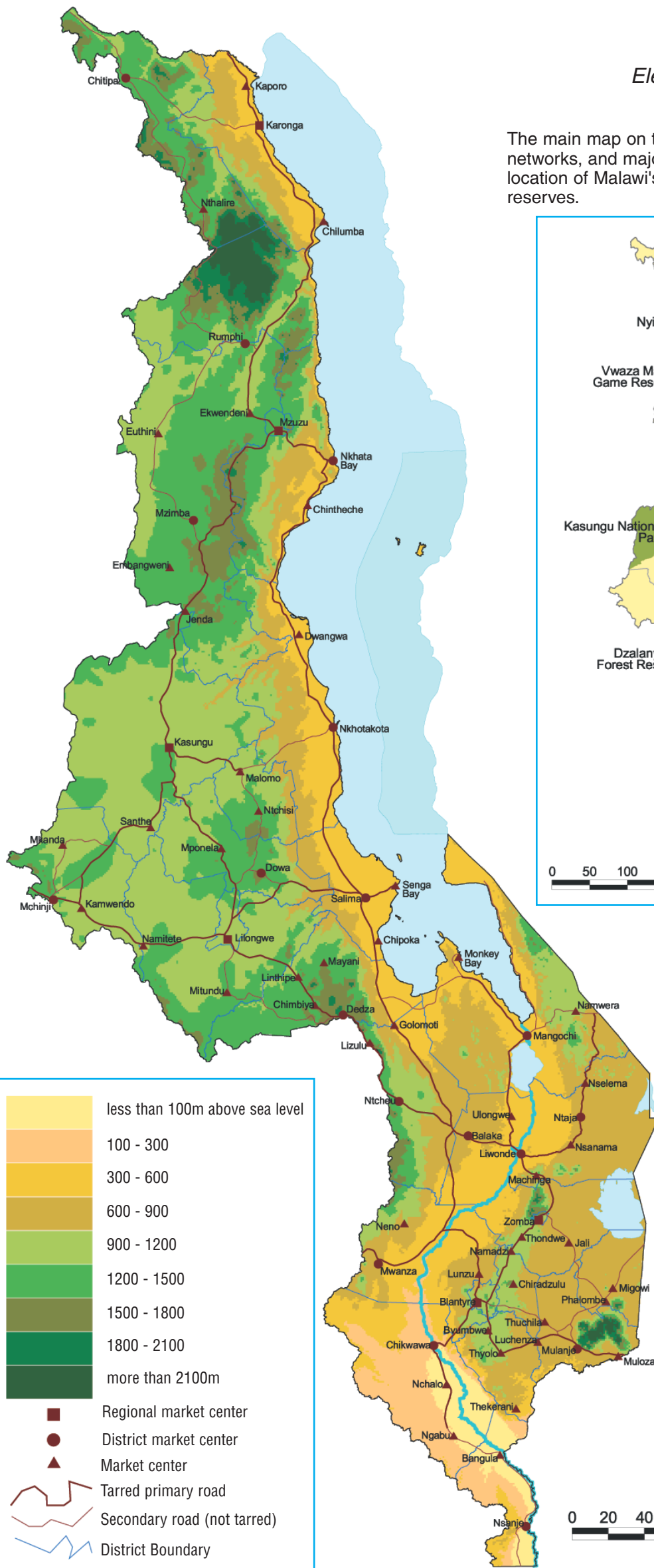


Malawi

Elevation and other features

Malawi 1998

The main map on this page shows elevation, major road networks, and major market centers. The smaller map shows the location of Malawi's major national parks and game and forest reserves.



	less than 100m above sea level
	100 - 300
	300 - 600
	600 - 900
	900 - 1200
	1200 - 1500
	1500 - 1800
	1800 - 2100
	more than 2100m
	Regional market center
	District market center
	Market center
	Tarred primary road
	Secondary road (not tarred)
	District Boundary

0 20 40 60 80 100 Kilometers

Traditional authorities of northern and part of central Malawi

The traditional authorities (TAs) depicted in this map of the northern and central regions (excluding Ntcheu district) are those used by the National Statistical Office to organize their data-collection efforts. District and local government authorities may recognize additional TAs to those shown here.



Traditional authorities of southern Malawi and Ntcheu district of central Malawi

The traditional authorities (TAs) depicted in this map of the southern region and Ntcheu district of the central region are those used by the National Statistical Office to organize their data-collection efforts. District and local government authorities may recognize additional TAs to those shown here.



- 1 - Machinga Boma
- 2 - Chiradzulu Boma
- 3 - Thyolo Boma
- 4 - Luchenza Town

TA - Traditional Authorities
 SC - Sub-Chief

— District Boundary

0 10 20 30 40 50 Kilometers

Data: NSO, 1998.

Administrative wards of the four major urban centers of Malawi

Urban administrative wards are comparable to rural traditional authorities. Administrative wards are used by the National Statistical Office to organize their data-collection efforts in the urban centers.

Mzuzu



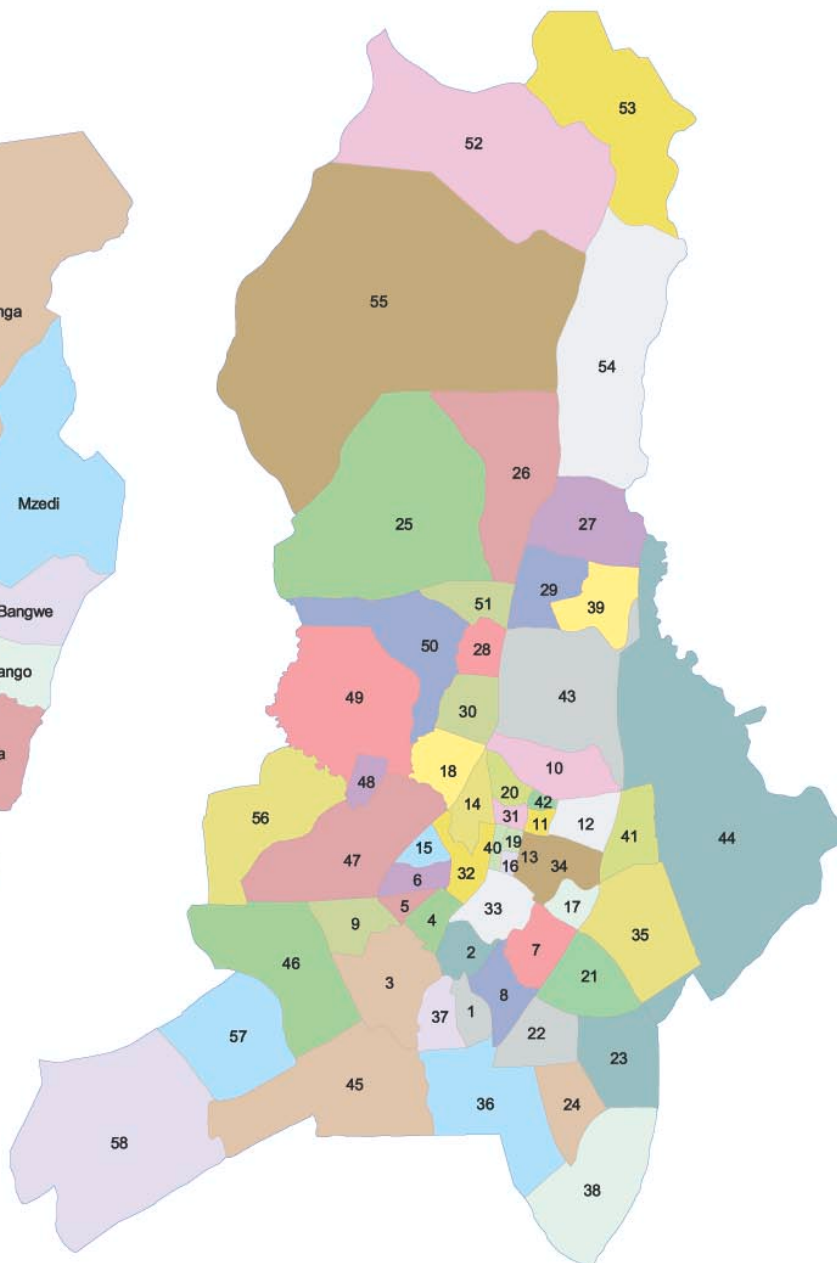
Zomba



Blantyre



Lilongwe

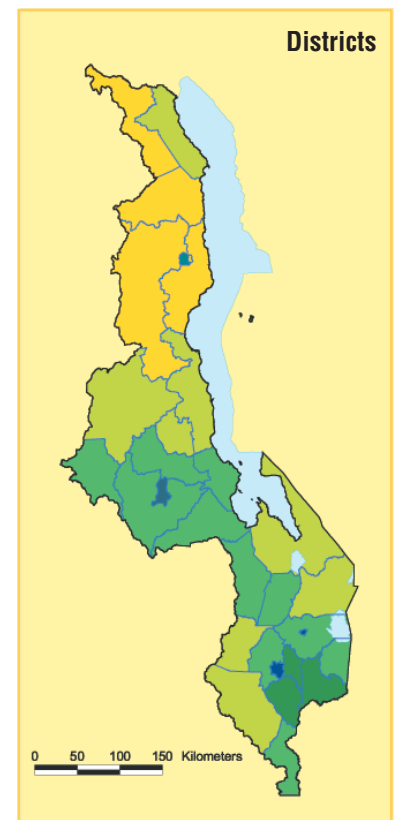
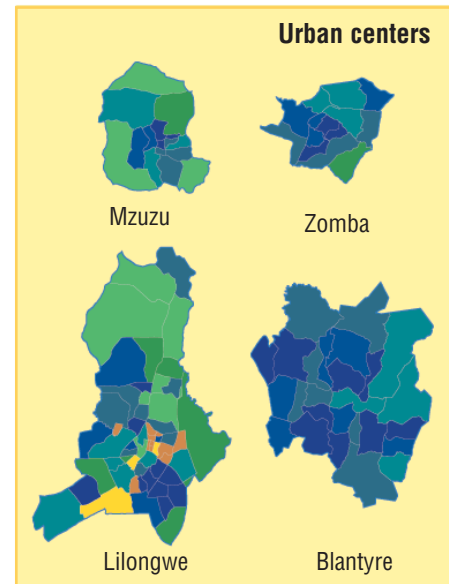
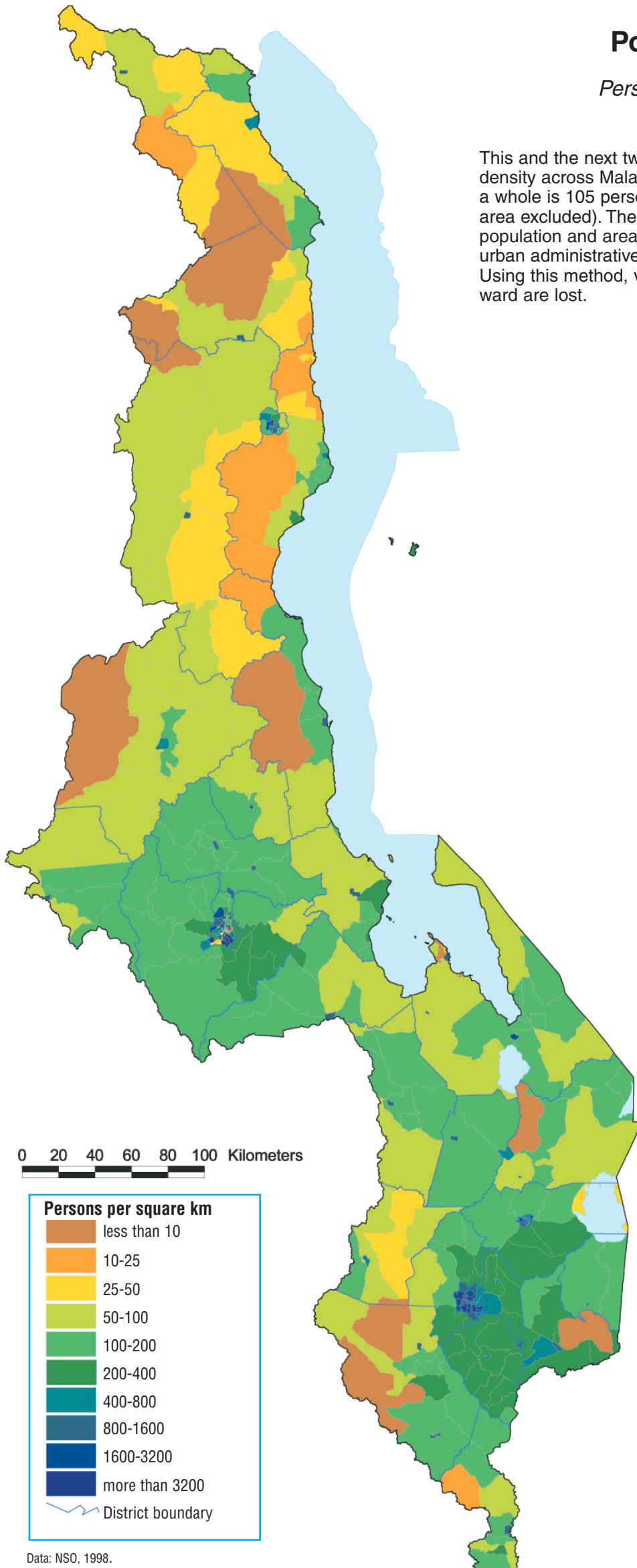


Data: NSO, 1998.
 Note: Scales vary.
 The urban administrative wards of Lilongwe are numbered "areas".

Population density

Persons per square kilometer
Malawi 1988

This and the next two maps show information on population density across Malawi. The population density for the nation as a whole is 105 persons per square kilometer of land area (lake area excluded). The maps on this page were created using the population and area totals for the traditional authorities (TAs) and urban administrative wards detailed in the preceding maps. Using this method, variations in population density within a TA or ward are lost.



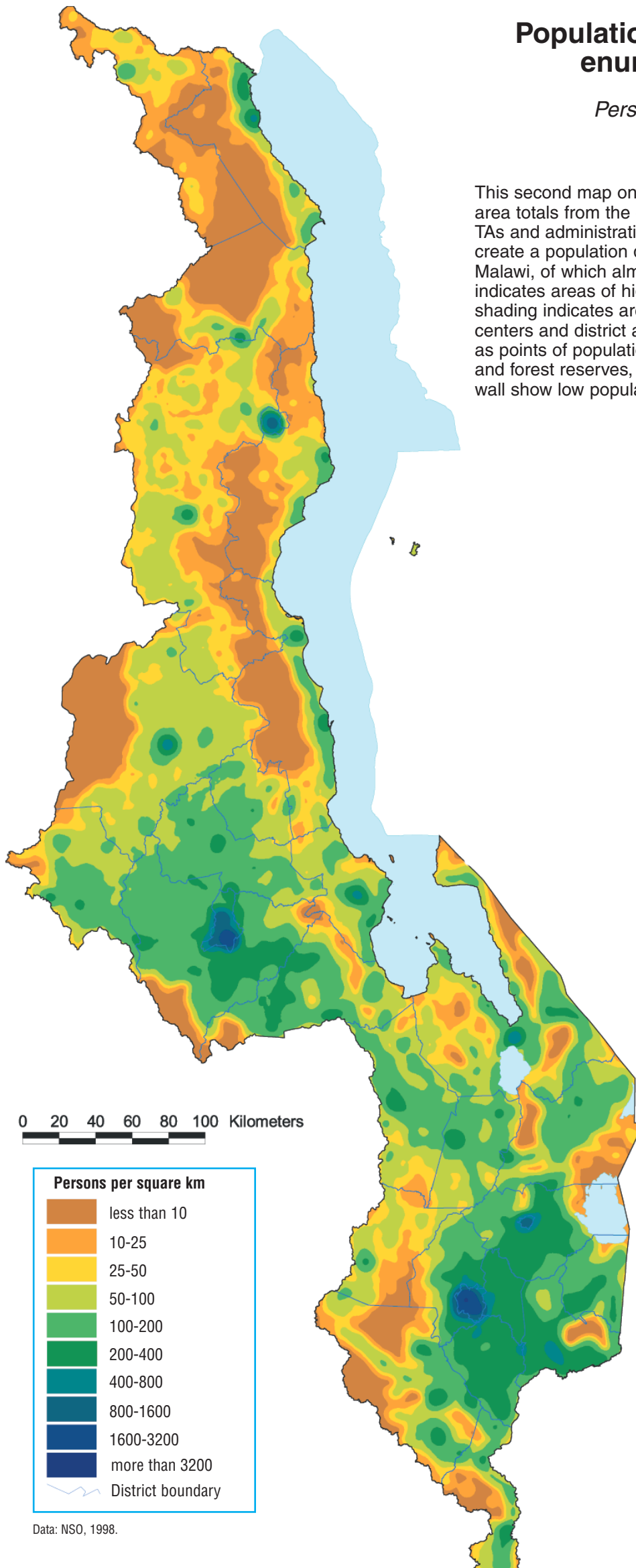
Data: NSO, 1998.

Population density surface from enumeration area data

Persons per square kilometer

Malawi 1998

This second map on population density uses population and area totals from the census enumeration areas, rather than the TAs and administrative wards used in the preceding maps, to create a population density surface. There are over 9,220 EAs in Malawi, of which almost 9,150 are populated. Blue shading indicates areas of high population, whereas brown and yellow shading indicates areas of low population. Naturally, urban centers and district administrative and trading centers stand out as points of population concentration, while national parks, game and forest reserves, and escarpment areas along the Rift Valley wall show low population density.



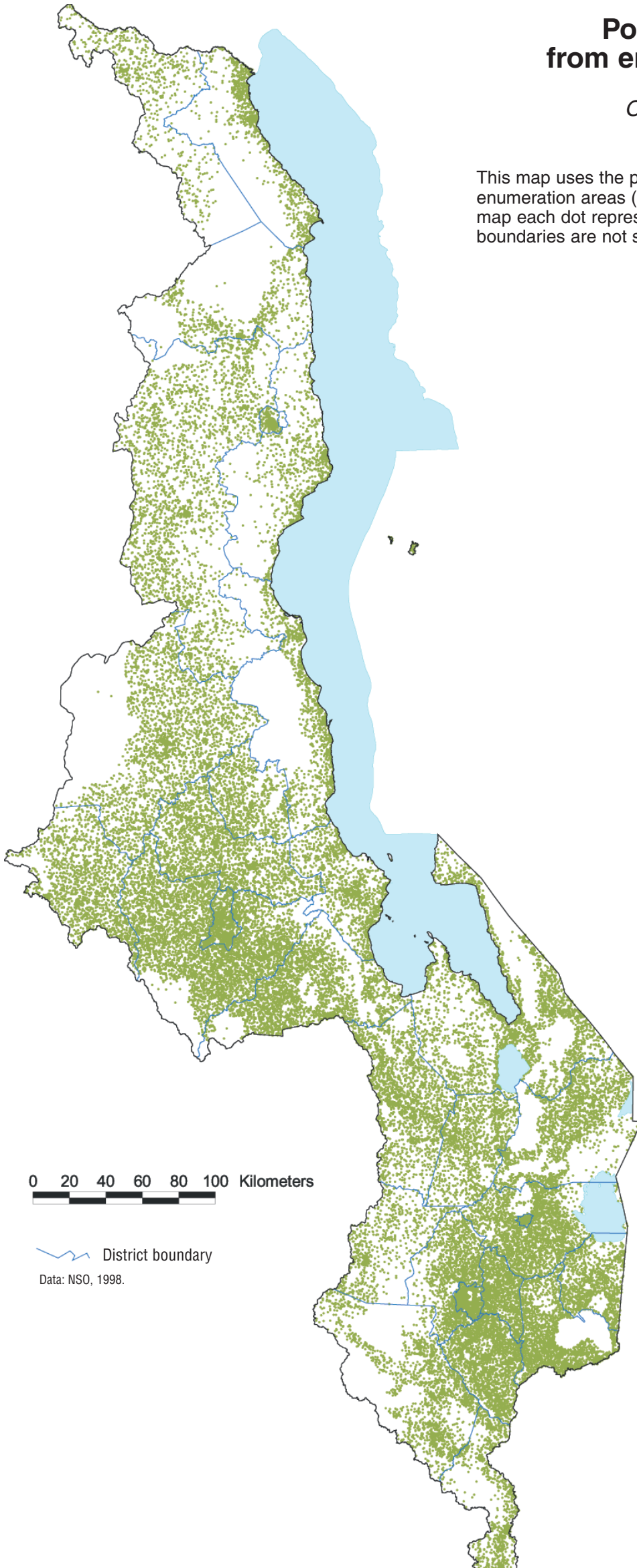
Data: NSO, 1998.

Population dot map from enumeration area data

One dot = 200 persons

Malawi 1998

This map uses the population totals from the census enumeration areas (EAs) used in the previous map, but in this map each dot represents 200 persons. Note that the EA boundaries are not shown on the map.



0 20 40 60 80 100 Kilometers

— District boundary

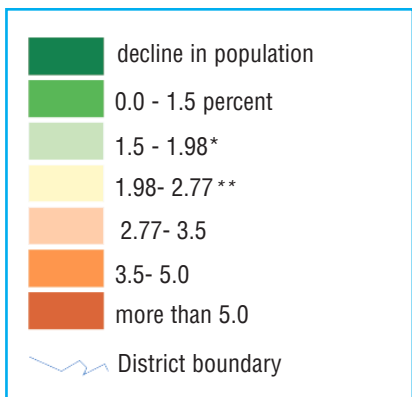
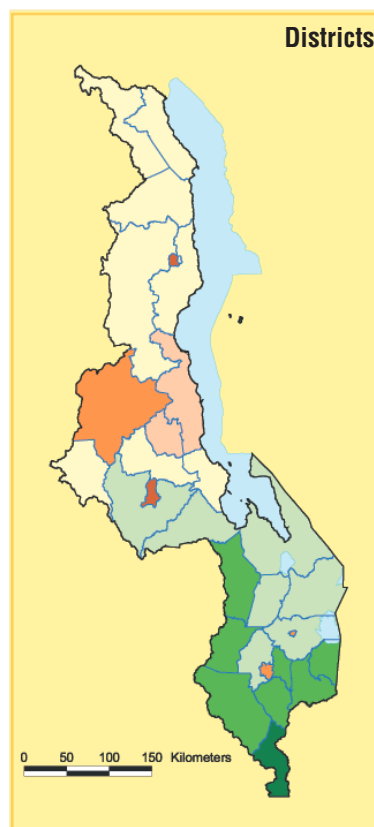
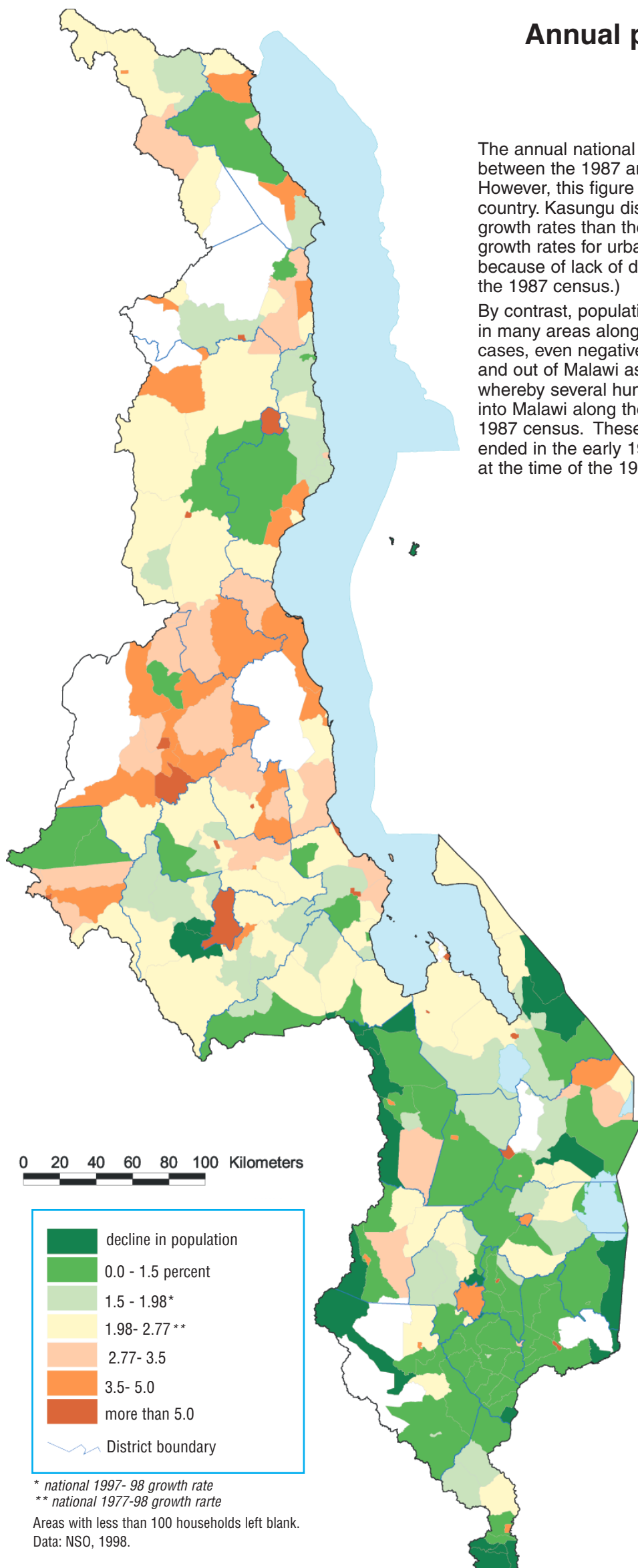
Data: NSO, 1998.

Annual population growth rate, 1987 to 1998

Malawi

The annual national population growth rate for the period between the 1987 and 1998 censuses was 1.98 percent. However, this figure masks considerable variation across the country. Kasungu district and the urban areas had much higher growth rates than the national average. (Note that population growth rates for urban wards could not be calculated separately because of lack of disaggregated data on ward populations from the 1987 census.)

By contrast, population growth for the same period was very low in many areas along the Mozambique border and was, in some cases, even negative. This is explained by refugee movements in and out of Malawi as a result of the Mozambique civil war, whereby several hundreds of thousands of refugees had crossed into Malawi along the border with Mozambique at the time of the 1987 census. These refugees returned home when the civil war ended in the early 1990s and were not longer resident in Malawi at the time of the 1998 census.

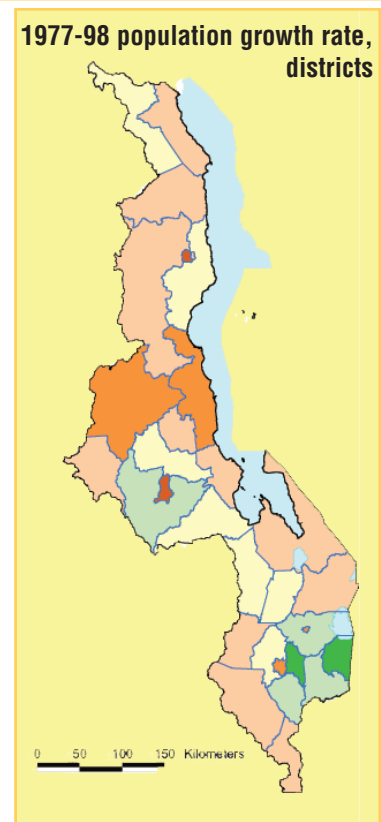
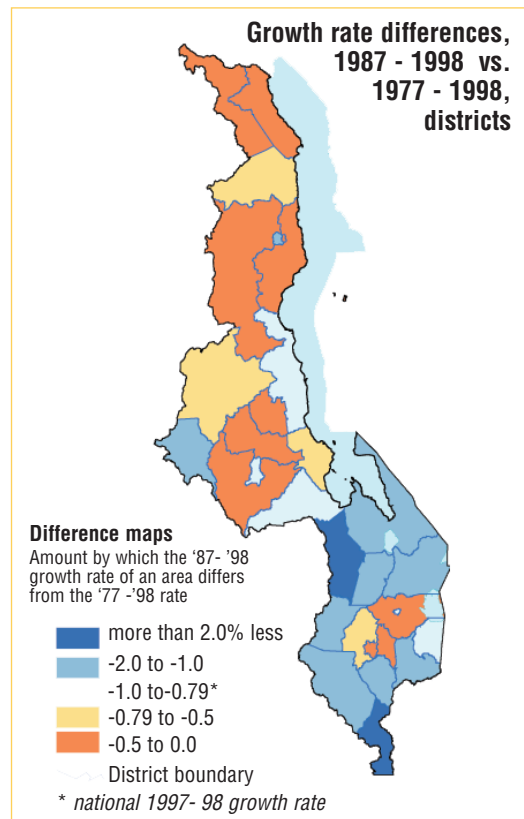
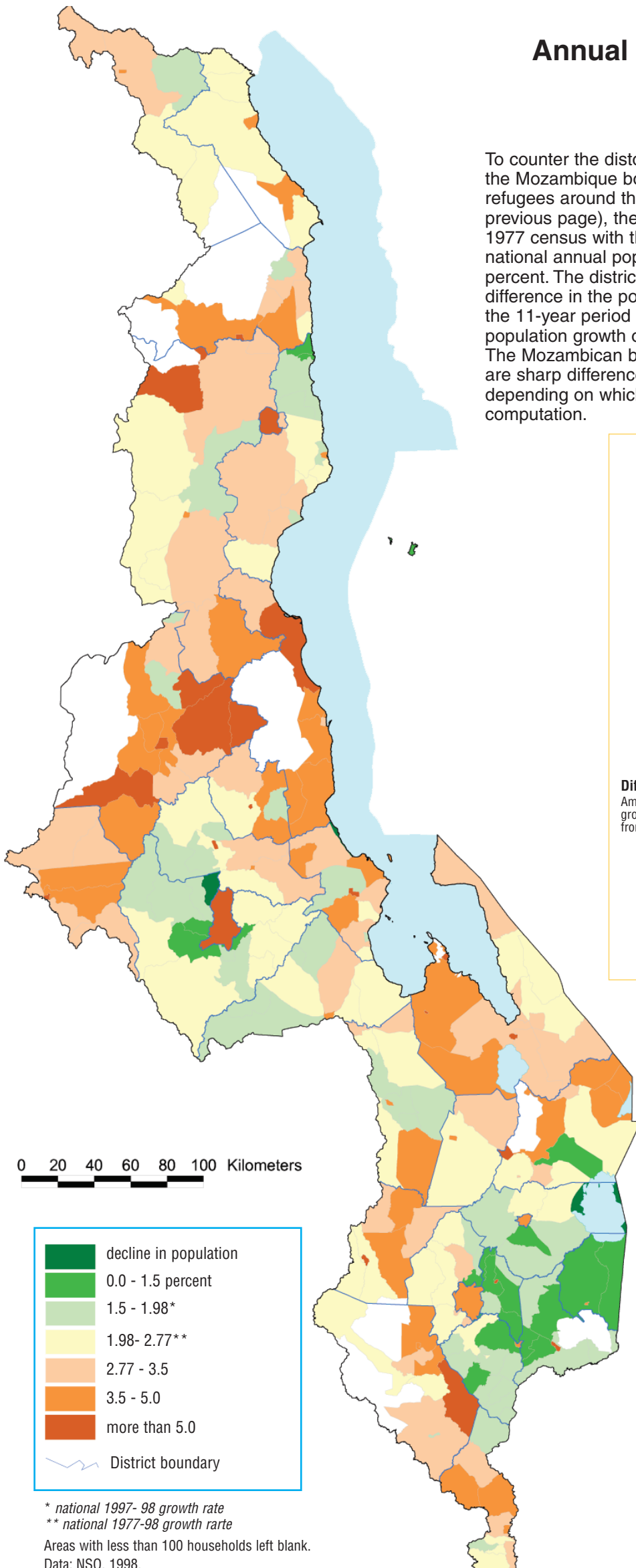


* national 1997- 98 growth rate
 ** national 1977-98 growth rate
 Areas with less than 100 households left blank.
 Data: NSO, 1998.

Annual population growth rate, 1977 to 1998

Malawi

To counter the distortions in the population growth rates along the Mozambique border resulting from the movement of refugees around the time of the 1987 census (discussed on the previous page), the maps on this page use data from the earlier 1977 census with the 1998 census to calculate growth rates. The national annual population growth rate for this period was 2.77 percent. The district map immediately below shows the difference in the population growth rates when calculated over the 11-year period 1987 to 1998 to those calculated from the population growth over the 21 years between 1977 and 1998. The Mozambican border areas stand out as areas where there are sharp differences in the rates of population growth depending on which of the earlier censuses is used in the computation.



- decline in population
- 0.0 - 1.5 percent
- 1.5 - 1.98*
- 1.98 - 2.77**
- 2.77 - 3.5
- 3.5 - 5.0
- more than 5.0
- District boundary

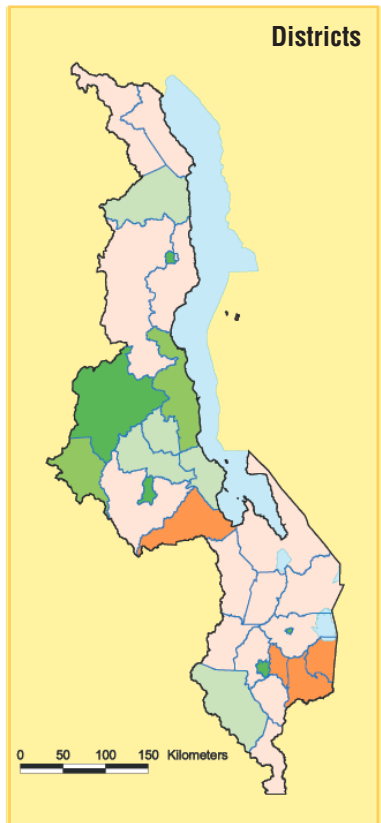
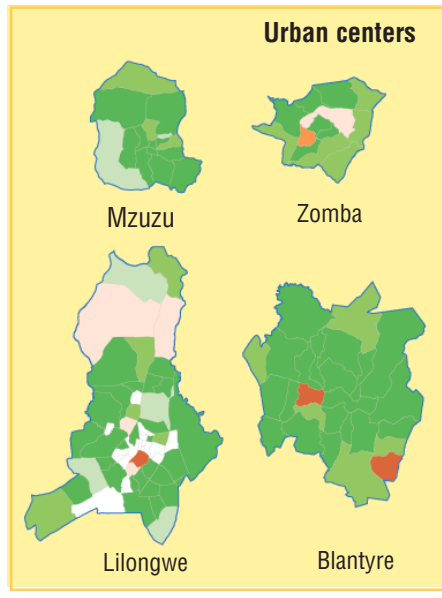
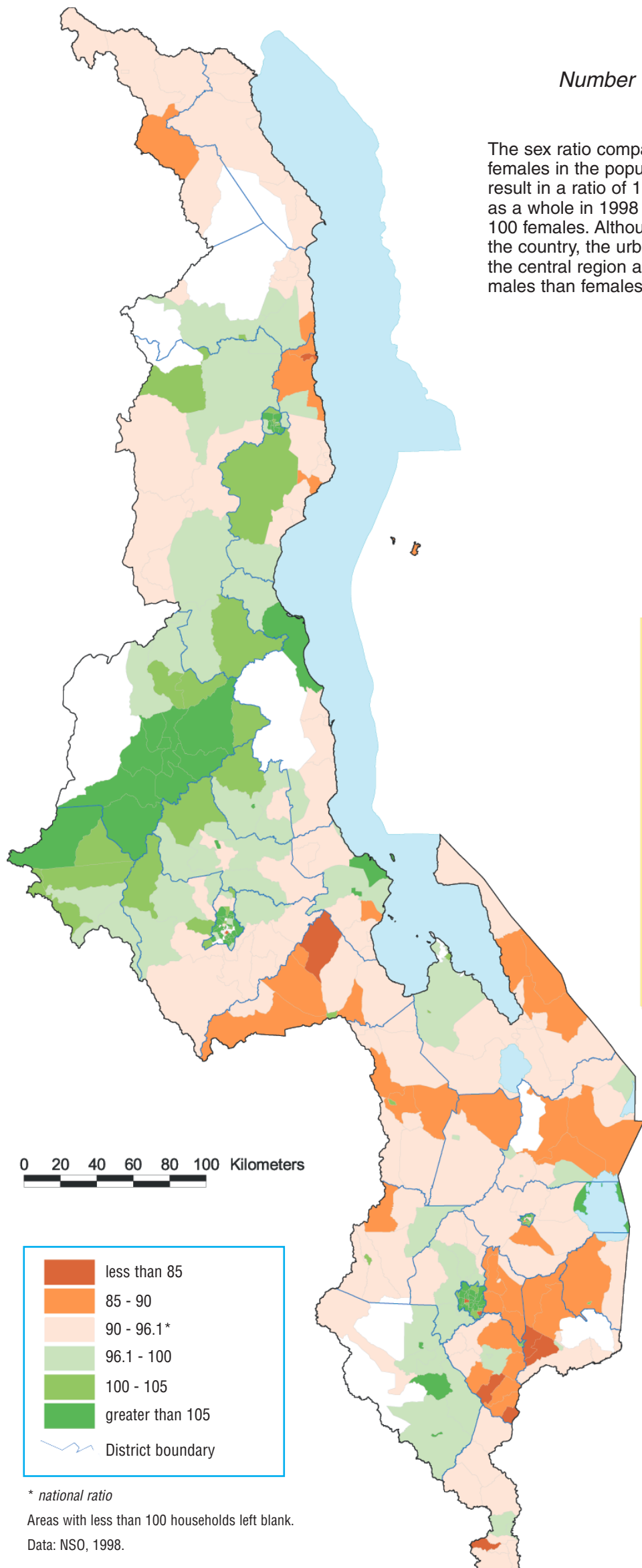
* national 1997-98 growth rate
 ** national 1977-98 growth rate

Areas with less than 100 households left blank.
 Data: NSO, 1998.

Sex ratio

Number of males for every 100 females
Malawi 1998

The sex ratio compares the numbers of males to the number of females in the population. Equal numbers of each gender will result in a ratio of 100. The sex ratio for the population of Malawi as a whole in 1998 was 96.1, that is, just over 96 males for every 100 females. Although females outnumber men in most areas of the country, the urban centers and the tobacco estate areas of the central region are notable for having greater numbers of males than females.



* national ratio
 Areas with less than 100 households left blank.
 Data: NSO, 1998.

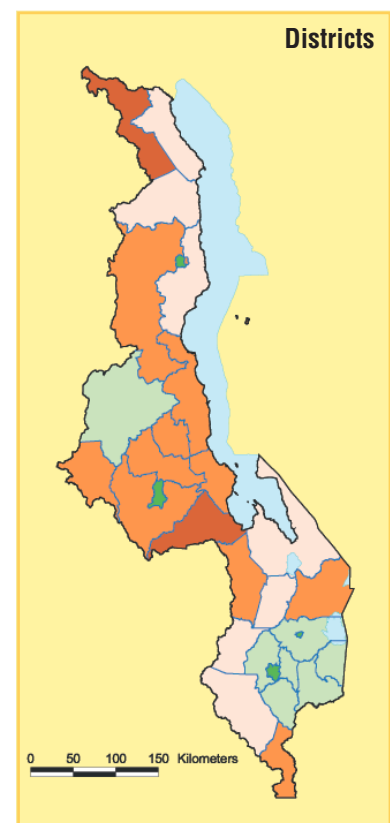
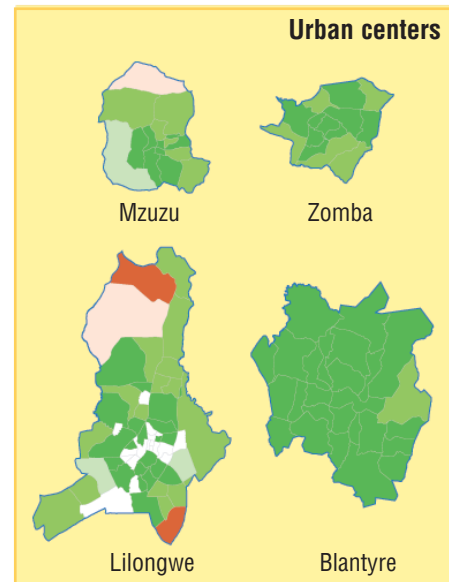
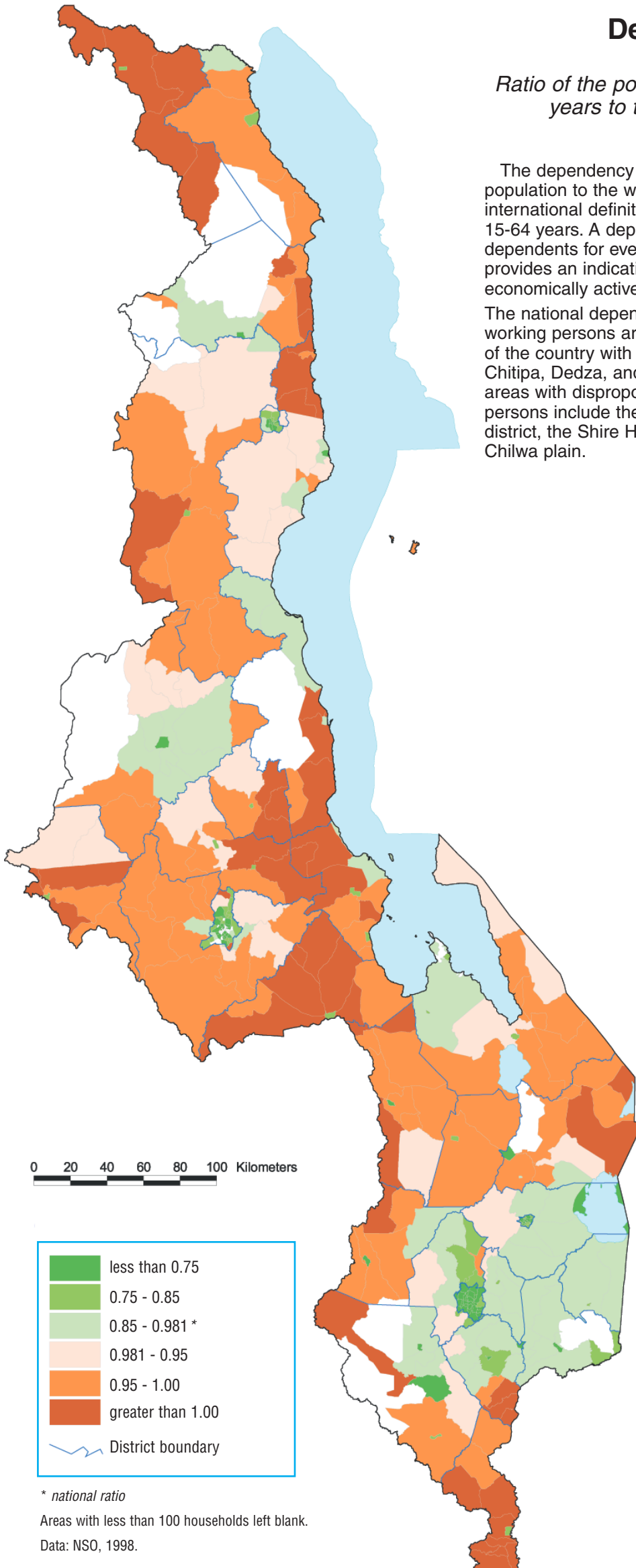
Dependency ratio

Ratio of the population aged under 15 or over 64 years to the population aged 15 to 64

Malawi 1998

The dependency ratio is the ratio of the non-working population to the working population, using the common international definition of the working population as those aged 15-64 years. A dependency ratio of 0.8 means there are 8 dependents for every 10 working-age persons. This statistic provides an indication of the level of responsibility of economically active persons in providing for their dependents.

The national dependency ratio for Malawi is 0.906 - every 10 working persons are supporting just over 9 dependents. Areas of the country with a notably higher dependency ratio are Chitipa, Dedza, and Nsanje districts. As might be expected, areas with disproportionately large numbers of working-age persons include the four urban centers, but also Kasungu district, the Shire Highlands around Blantyre, and the Lake Chilwa plain.



* national ratio

Areas with less than 100 households left blank.

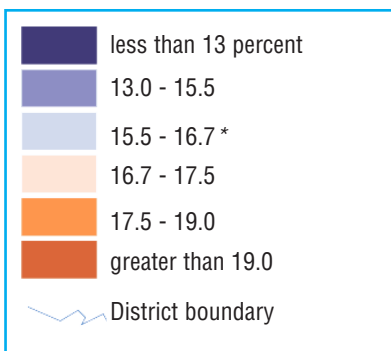
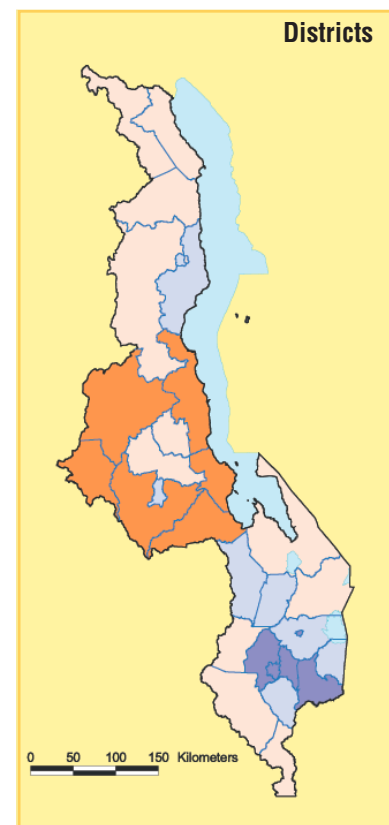
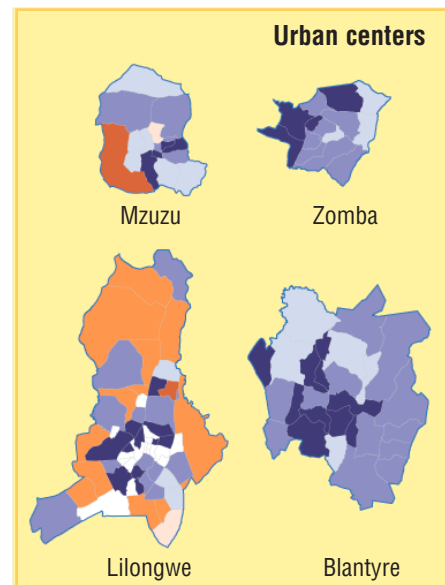
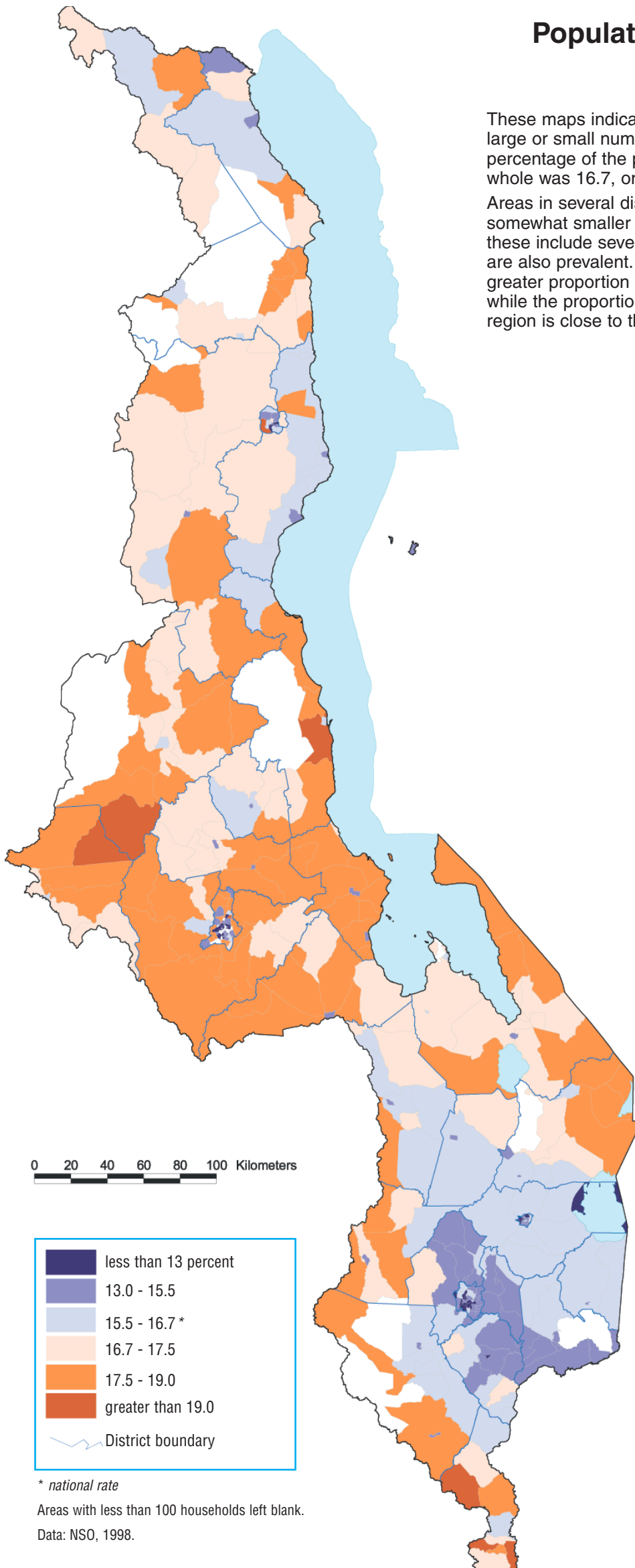
Data: NSO, 1998.

Population under five years old

Malawi 1998

These maps indicate areas of the country with disproportionately large or small numbers of young children. In 1998, the percentage of the population under five years old for Malawi as a whole was 16.7, or about one-sixth.

Areas in several districts in the southern region are notable for a somewhat smaller proportion of young children than is the norm; these include several areas where female heads of households are also prevalent. Most areas of the central region have a greater proportion of young children than the national norm, while the proportion of under-fives in most areas of the northern region is close to the national average.



* national rate

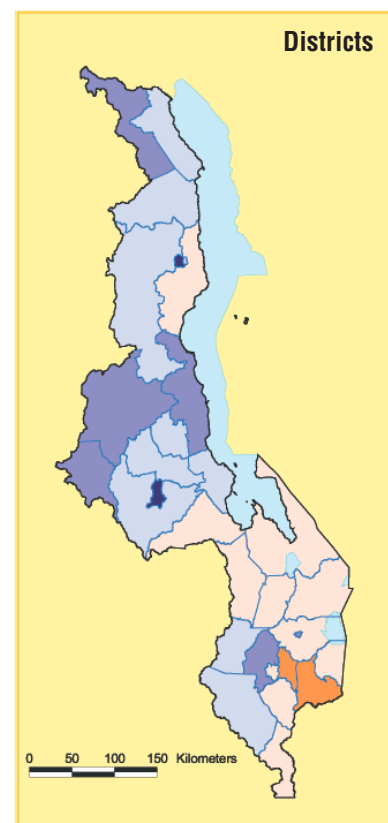
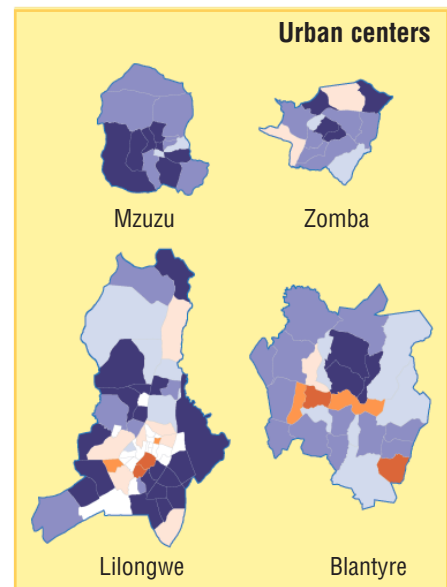
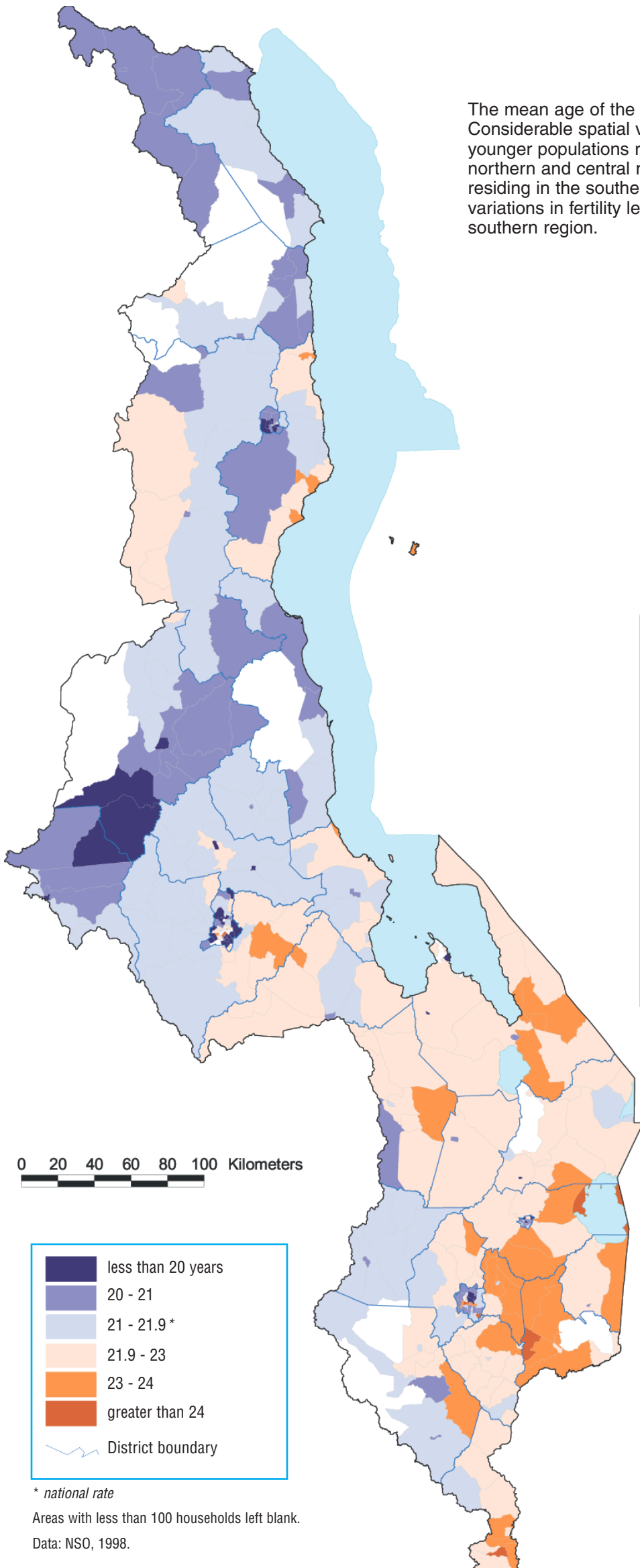
Areas with less than 100 households left blank.

Data: NSO, 1998.

Mean age

Malawi 1998

The mean age of the population of Malawi is 21.9 years. Considerable spatial variation exists across the country, with younger populations residing in the urban centers and in the northern and central regions, and relatively older populations residing in the southern region. This trend is likely the result of variations in fertility levels, given relatively lower levels in the southern region.



* national rate

Areas with less than 100 households left blank.

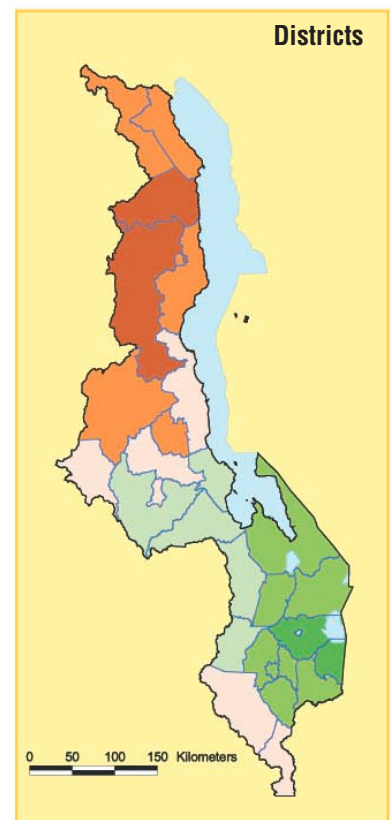
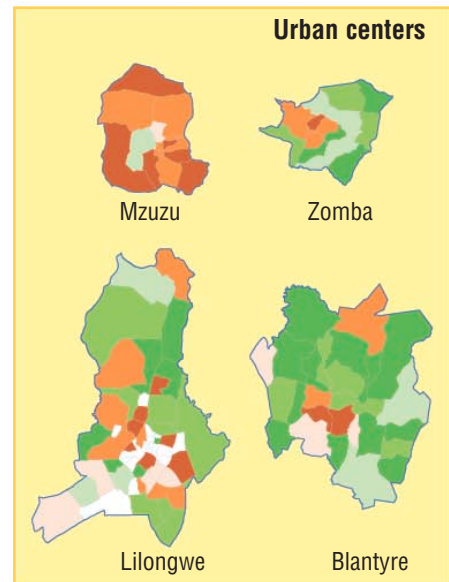
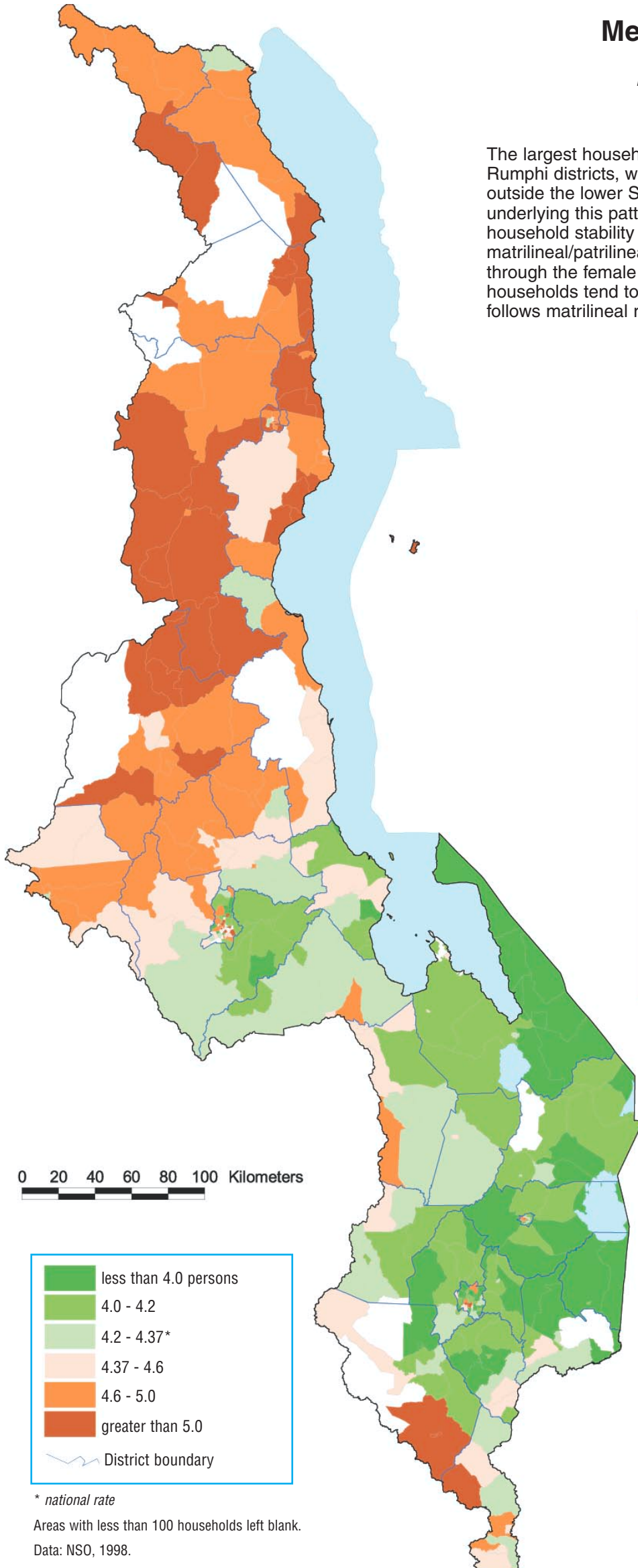
Data: NSO, 1998.

Mean household size

Persons per household

Malawi 1998

The largest households in Malawi are found in Mzimba and Rumpfi districts, while households in the southern region, outside the lower Shire valley, tend to be the smallest. Likely underlying this pattern are differences in fertility and in household stability arising, in part, from features of the matrilineal/patrilineal kinship systems (that is, inheritance through the female or male sides of the family). Smaller households tend to be found in areas where the population follows matrilineal rules of kinship and inheritance.



* national rate

Areas with less than 100 households left blank.

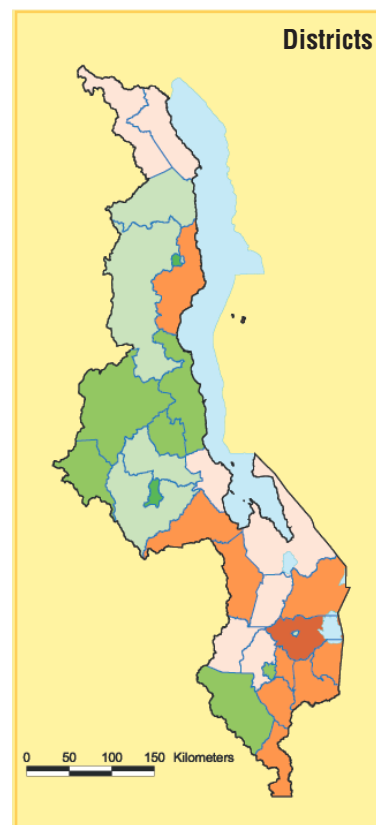
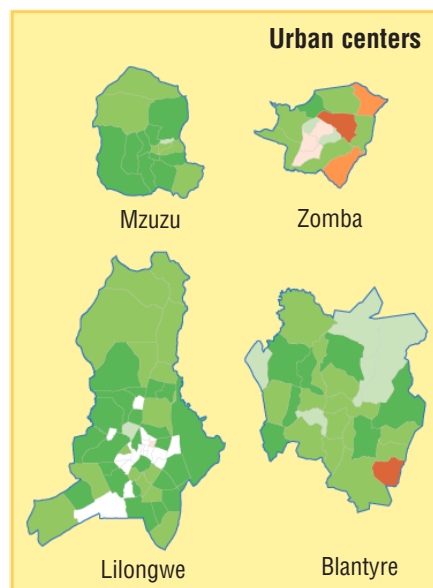
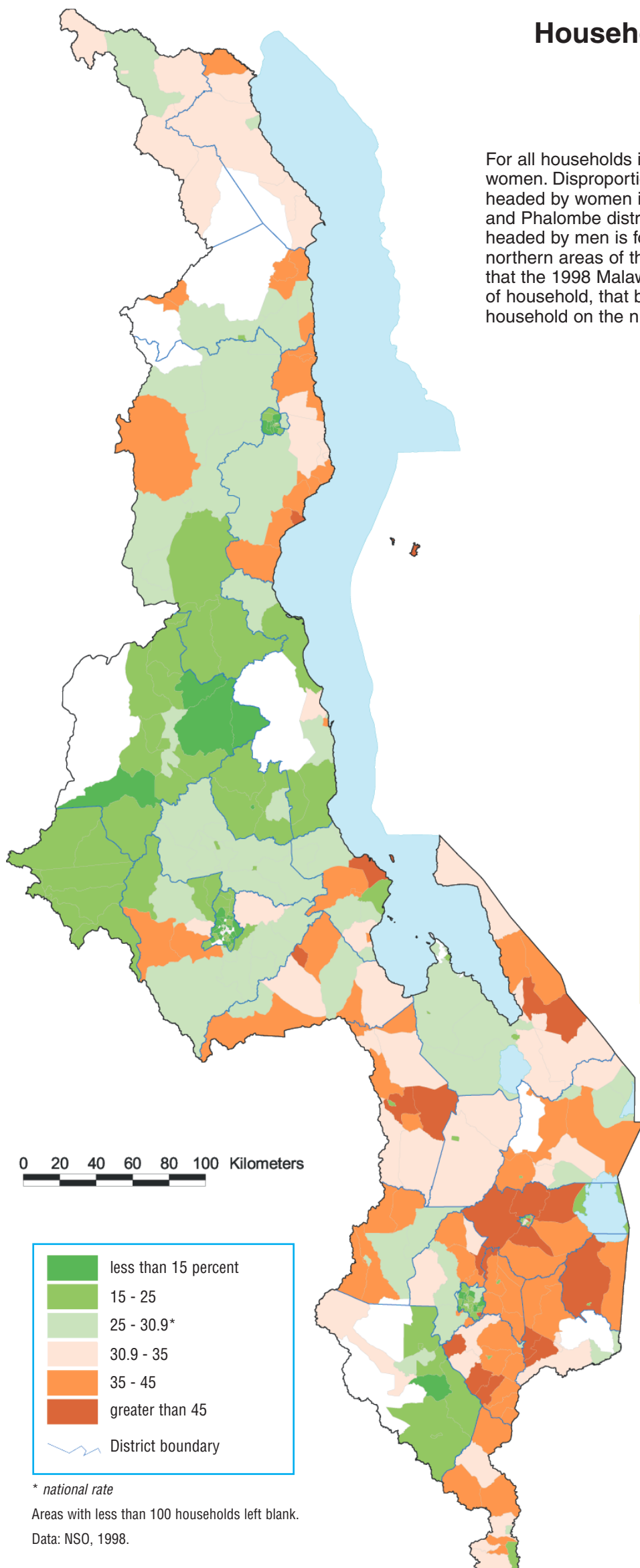
Data: NSO, 1998.

Households headed by women

Percent

Malawi 1998

For all households in Malawi, 30.9 percent are headed by women. Disproportionately high numbers of households are headed by women in the southern region, particularly in Zomba and Phalombe districts. The greatest proportion of households headed by men is found in the urban centers, in the middle and northern areas of the central region, and in Mzimba district. Note that the 1998 Malawi census used a de facto definition for head of household, that being the individual acting as head of the household on the night of September 1, 1998.



■	less than 15 percent
■	15 - 25
■	25 - 30.9*
■	30.9 - 35
■	35 - 45
■	greater than 45
—	District boundary

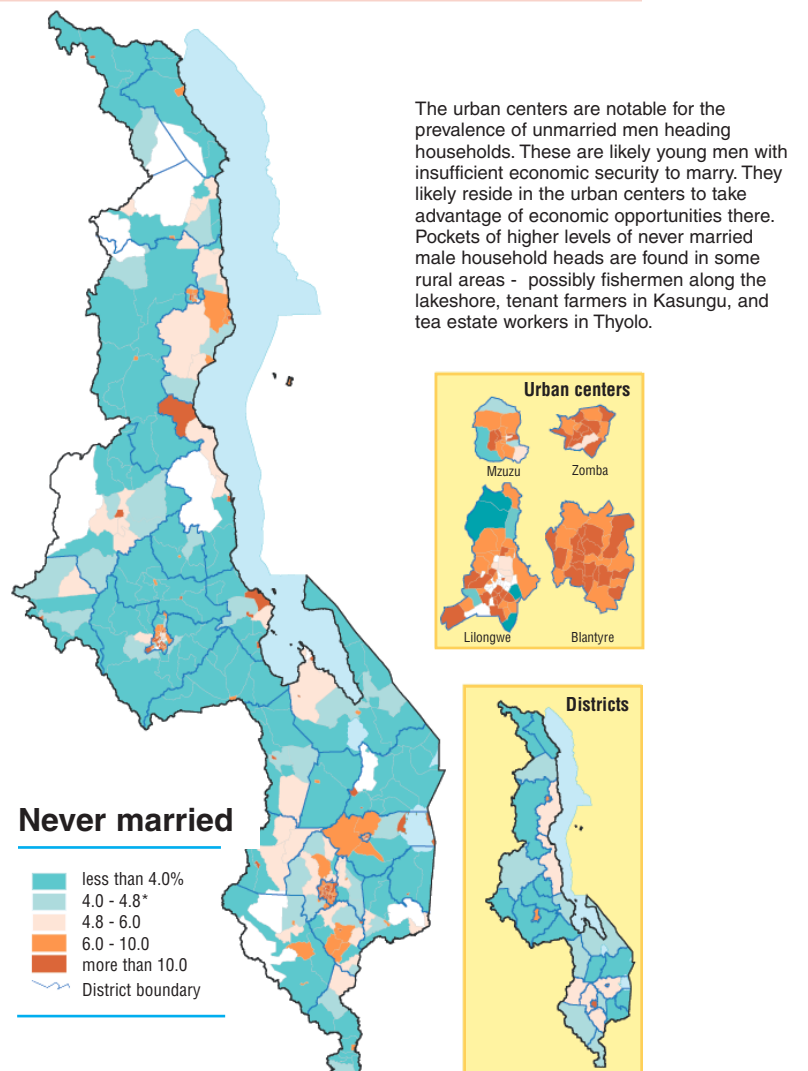
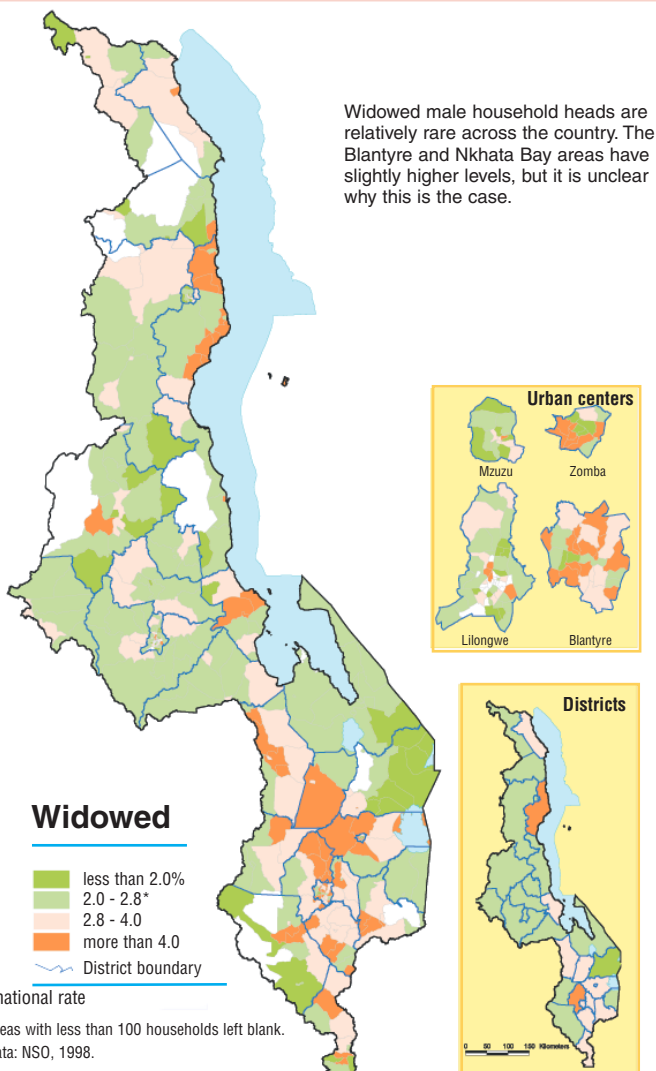
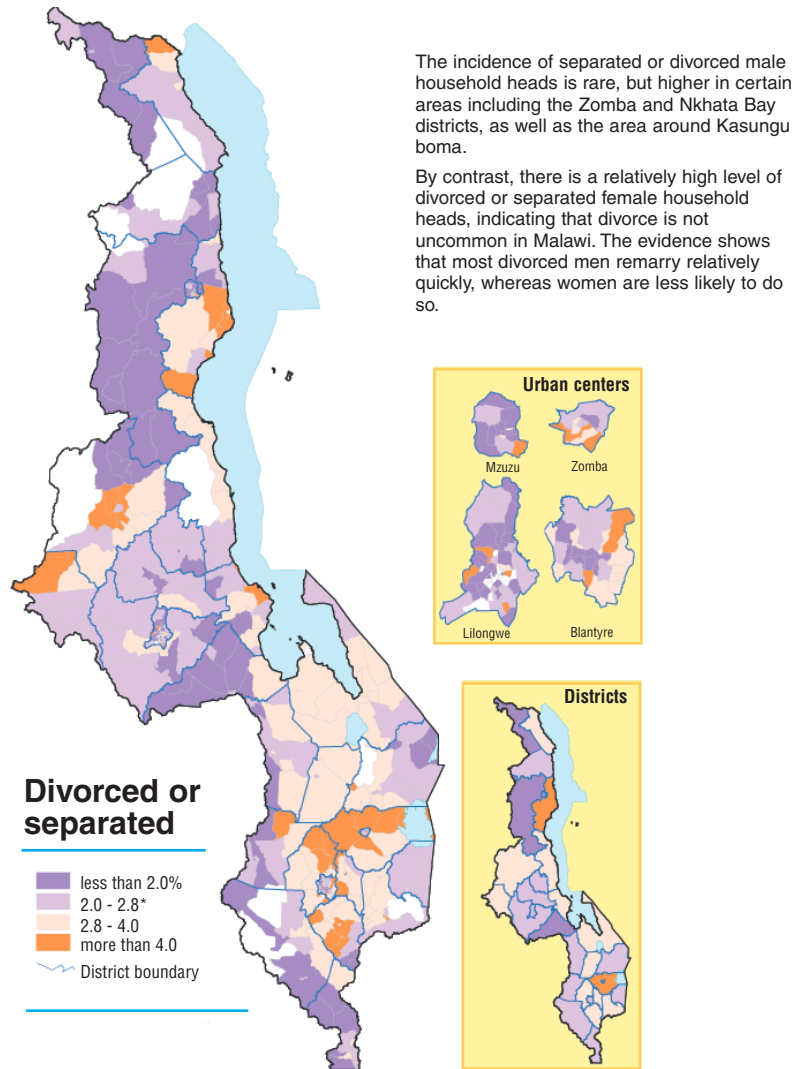
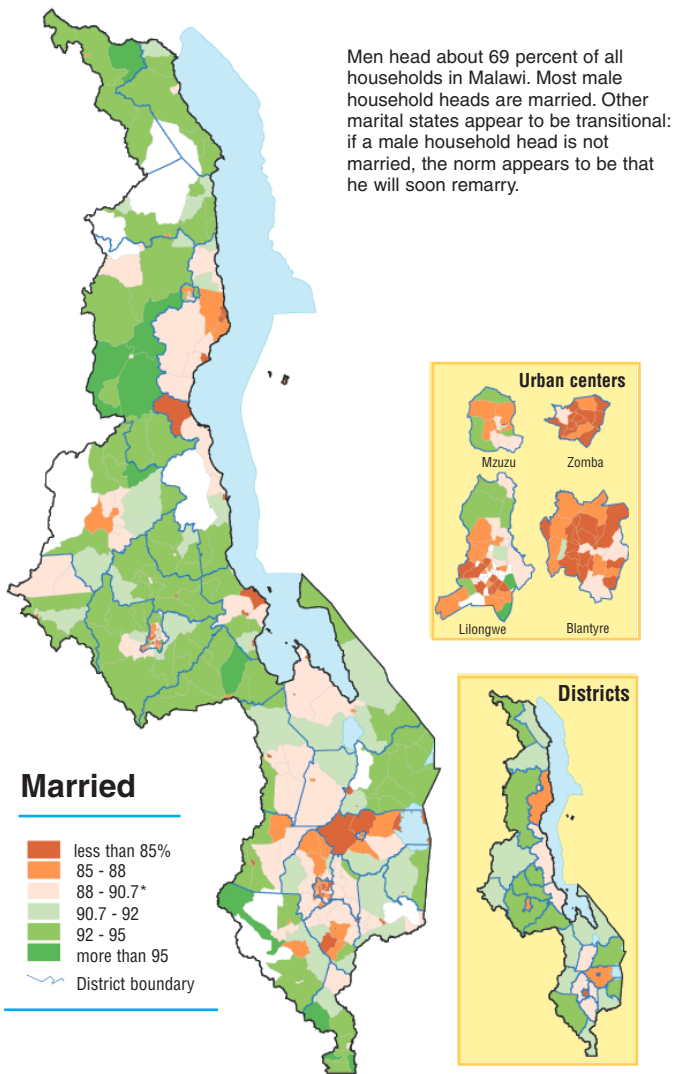
* national rate

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Data: NSO, 1998.

Marital status - male heads of household

Malawi 1998

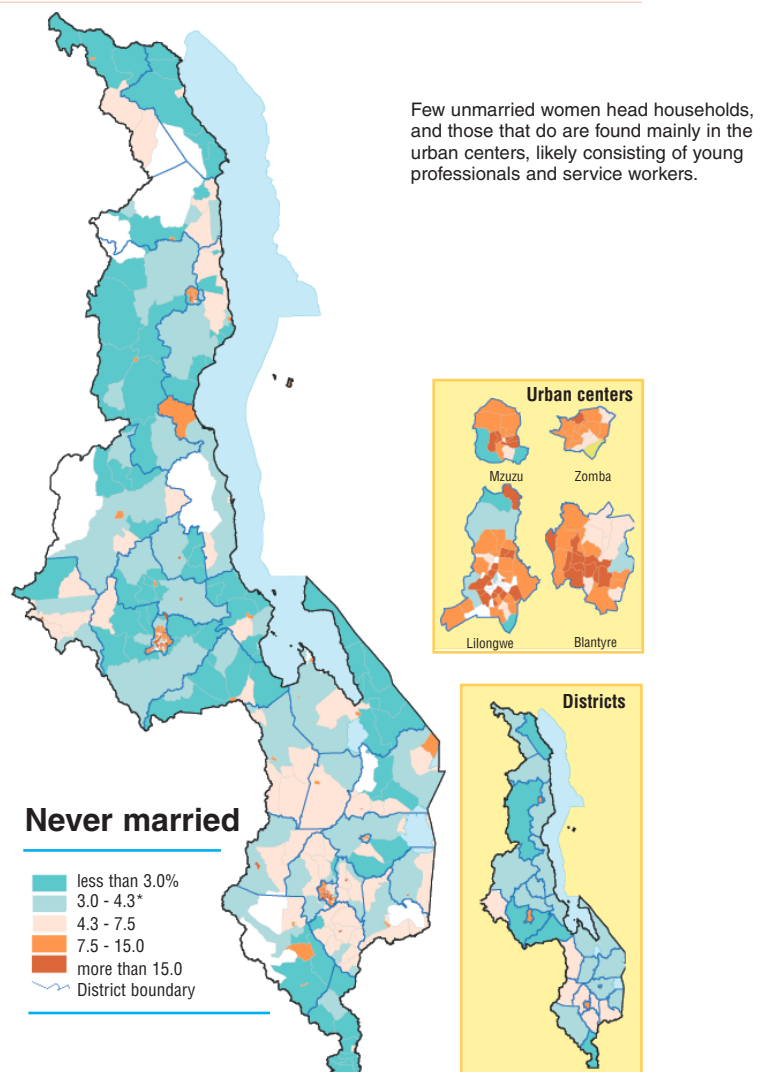
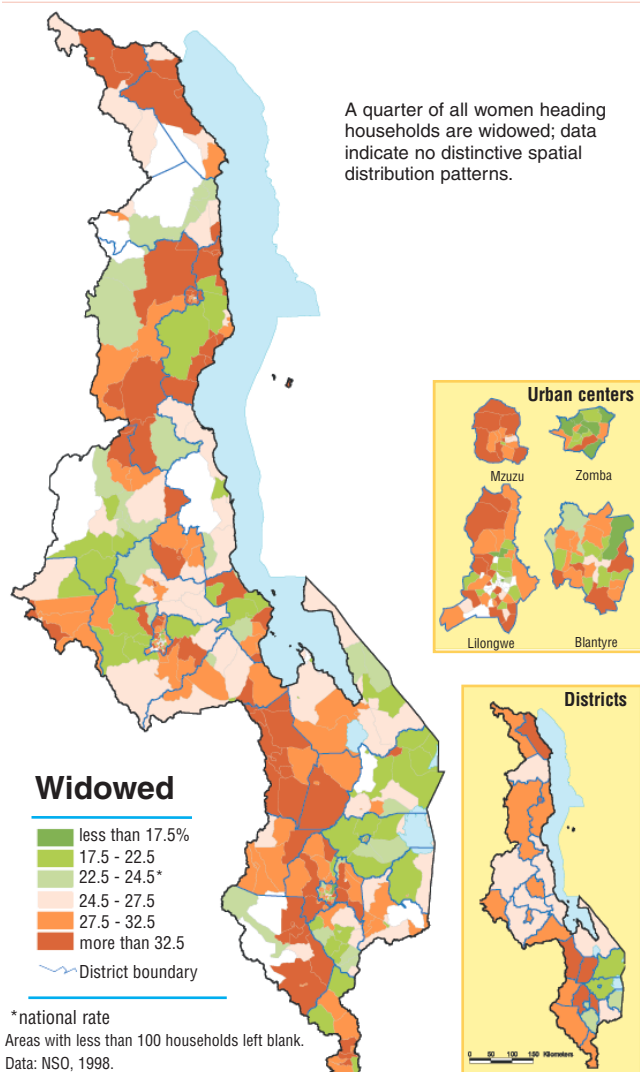
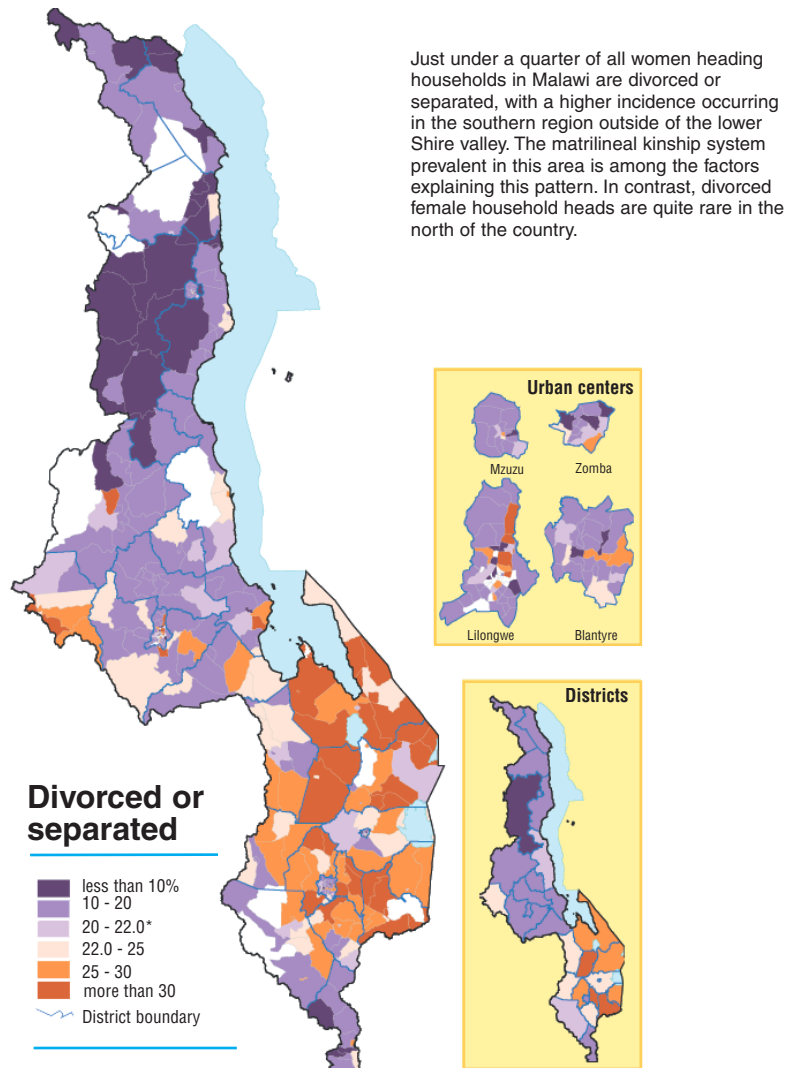
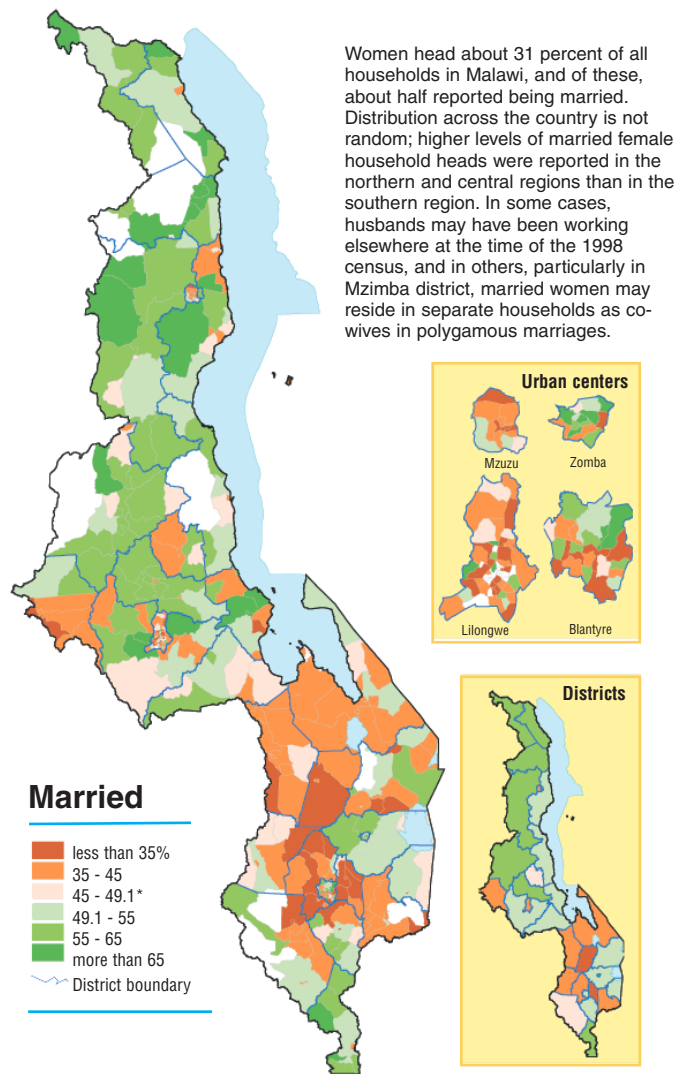


* national rate

Areas with less than 100 households left blank.
Data: NSO, 1998.

Marital status - female heads of household

Malawi 1998



Poverty mapping analysis involves, first, discovering the relationship between a set of characteristics of households and the welfare level of the same households as revealed by the analysis of a detailed household survey. Secondly, one then applies a model of this relationship to data on the same household characteristics contained in a national census in order to determine the welfare level of all households in the census. While a household survey can only provide estimates of household welfare and poverty at the level of the district or region, the resulting estimates derived from the census are spatially disaggregated to a much higher degree than is possible using survey information, providing an enhanced understanding of the spatial dimensions of poverty. Using the results of the poverty mapping analysis, comparisons between Traditional Authorities or local government wards as to the level of poverty in areas can be made, comparisons which cannot be made through the analysis of the household survey alone.

In late 2000 the poverty analysis of the 1997-98 Integrated Household Survey (IHS) was completed. This provided estimates of the incidence and severity of poverty in Malawi together with a close analysis of how poverty is correlated with a range of household characteristics. (NEC, 2000). The IHS was a detailed household survey which was administered in all districts of the country over a twelve month period. It contains detailed consumption and expenditure information, as well as a wide range of other data on the surveyed households. The data from this survey was used to establish basic-needs poverty lines for Malawi and to estimate the number of poor in the country.* The IHS is a rich data source, although it is limited to the extent that it was based on a sample of under 7,000 households nationally, and can only provide estimates of poverty at the level of the district and above.

In September 1998, during the period the IHS was being administered to survey households, the decennial Malawi Population and Housing Census was also carried out. Administered to all households in the nation, the census was standardized, simple, and easy to administer. While universal in coverage, the information collected was limited in scope.

Poverty mapping takes advantage of the poverty analysis of and the wealth of detail in the household survey and the universal coverage of the census. A model of household welfare is developed using the household survey data in a regression analysis. The variable which one is trying to explain in this model is the household welfare indicator - daily per capita consumption and expenditure of a household in Malawi Kwacha - which was calculated in the poverty analysis of the IHS. The independent or explanatory variables for the model are those household characteristic variables which are found in both the household survey and the census. Once a suitable model to estimate household welfare indicator levels is developed using the household survey data, that model is then applied to the census data in order to generate a household welfare indicator for each household in the census. Having estimated the level of welfare of census households, the proportion of households that are poor and other poverty measures for TAs, wards, villages and communities can then be calculated and mapped.

The poverty measures resulting from the poverty mapping exercise are presented in this chapter at two sub-district spatial scales - the traditional authority and the local government ward. It is at these scales and at even more local scales where the potential power of poverty mapping is most clearly seen. Although poverty incidence rates are relatively high in most areas of Malawi, there is considerable differentiation in poverty levels within districts. In addition to being mapped in the pages of this chapter, the poverty headcount, ultra-poverty headcount, depth of poverty, and severity of poverty measures for each district and Traditional Authority from the poverty mapping analysis are shown in Annex 3 of this atlas. Moreover, additional detail on the poverty mapping analysis methodology is provided in Annex 2. (Also see Benson, et al., 2002.)

It should be noted that at the national and district level, these results from the poverty mapping analysis are slightly different from those derived from the earlier poverty analysis of the IHS. However, the difference, particularly at the national level is quite small - 65.3 percent of Malawi's population was calculated to be poor using the poverty analysis of the IHS, whereas 64.3 percent is estimated to be poor according to the poverty mapping analysis presented here.

Finally, one should recognize that the definition of poverty used here is a standard, but nonetheless narrow view of poverty. Poverty in this research is defined as a level of consumption and expenditure by individuals in a household which has been calculated to be insufficient to meet their basic needs. This definition excludes from consideration several important components of personal and household well-being, including physical security, level of participation in networks of support and affection,

*A calorie-based basic needs poverty line was computed in the IHS poverty analysis. The poverty line is expressed in the same units as the welfare indicator - daily per capita consumption and expenditure of a household in Malawi Kwacha. In March 1998 Kwacha the weighted average poverty line was 10.47 (US \$0.41). Households whose welfare indicator is below the poverty line are defined as poor. The ultra-poverty line was arbitrarily set at 60 percent of the poverty line: MK 6.28 (US \$0.25)

access to important public social infrastructure such as health and educational services, and whether or not one can exercise ones human rights. In sum, there is more to assessing the quality of life and the welfare of individuals than consumption and expenditure. However for simplicity, for standardization and replicability, and for objectivity we have adopted here a consumption and expenditure based perspective on individual and household welfare and on poverty.

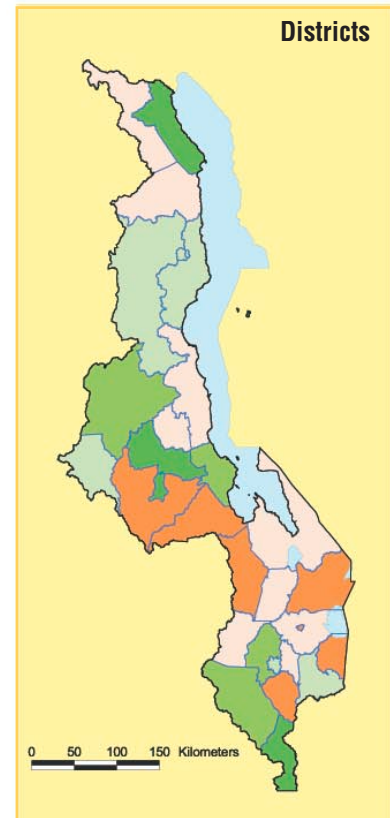
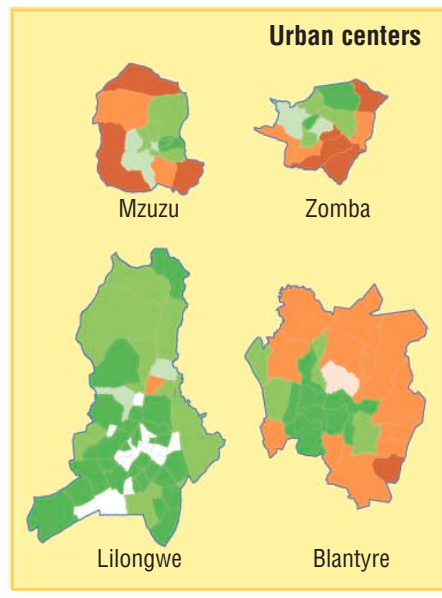
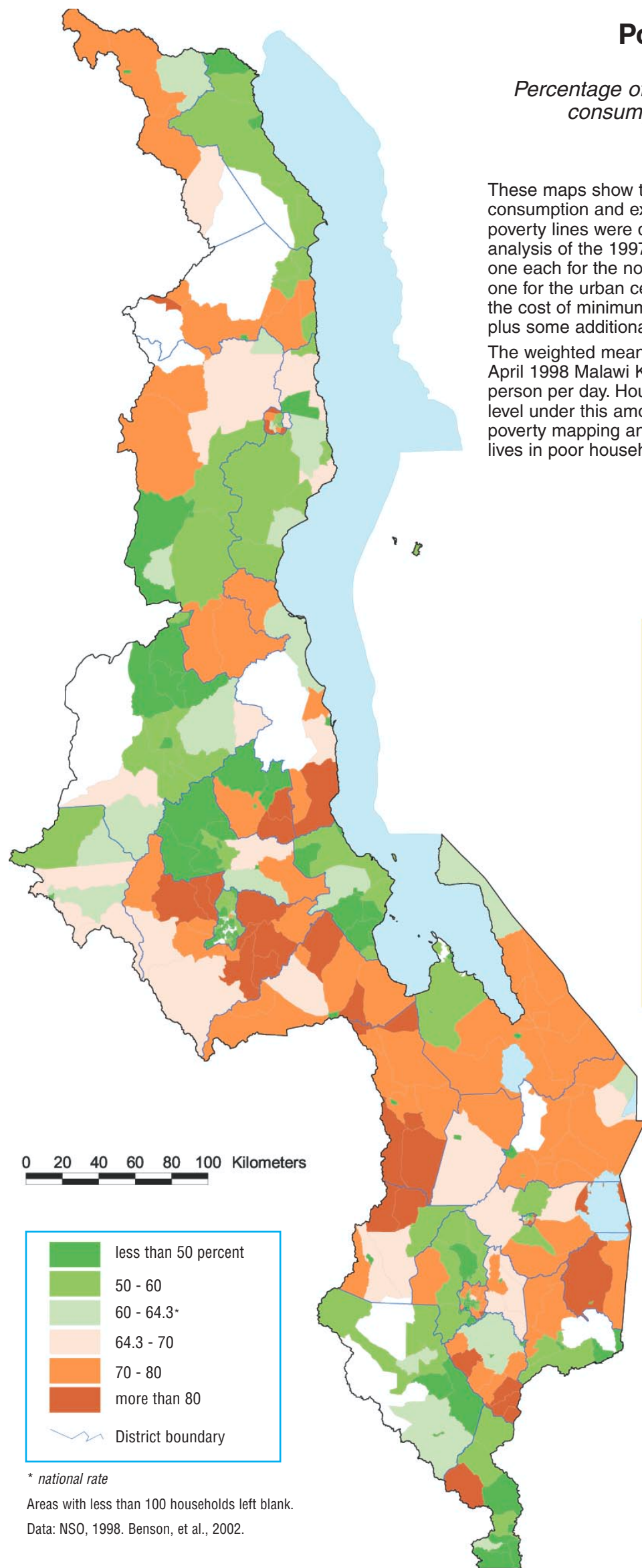
Poverty headcount

Percentage of the population whose level of daily consumption is below the poverty line

Malawi 1998

These maps show the proportion of the population whose daily consumption and expenditure falls below the poverty line. Four poverty lines were developed for Malawi as part of the poverty analysis of the 1997-98 Malawi Integrated Household Survey - one each for the northern, central, and southern regions, and one for the urban centers. These poverty lines were based on the cost of minimum recommended daily calorie requirements plus some additional basic nonfood items. (See PMS, 2000.)

The weighted mean poverty line for the nation as a whole in April 1998 Malawi Kwacha was 10.47 or about 41 U.S. cents per person per day. Households with a per capita daily consumption level under this amount are considered poor. Based on the poverty mapping analysis, 64.3 percent of Malawi's population lives in poor households.



0 20 40 60 80 100 Kilometers

	less than 50 percent
	50 - 60
	60 - 64.3*
	64.3 - 70
	70 - 80
	more than 80
	District boundary

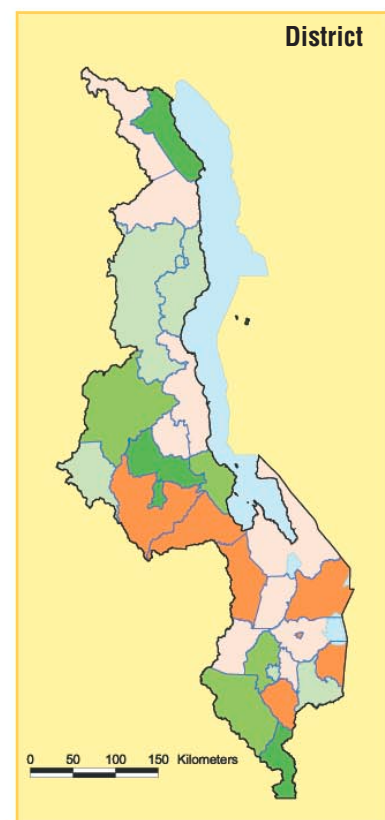
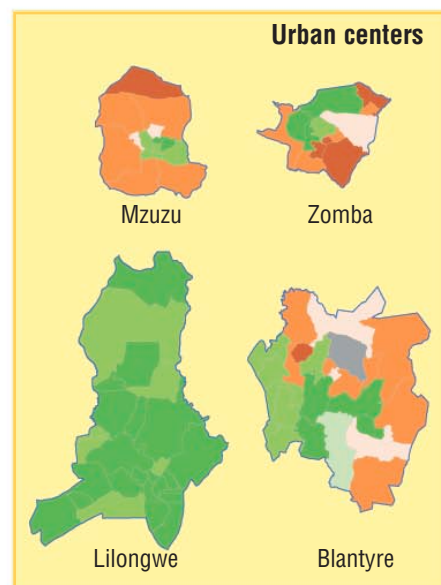
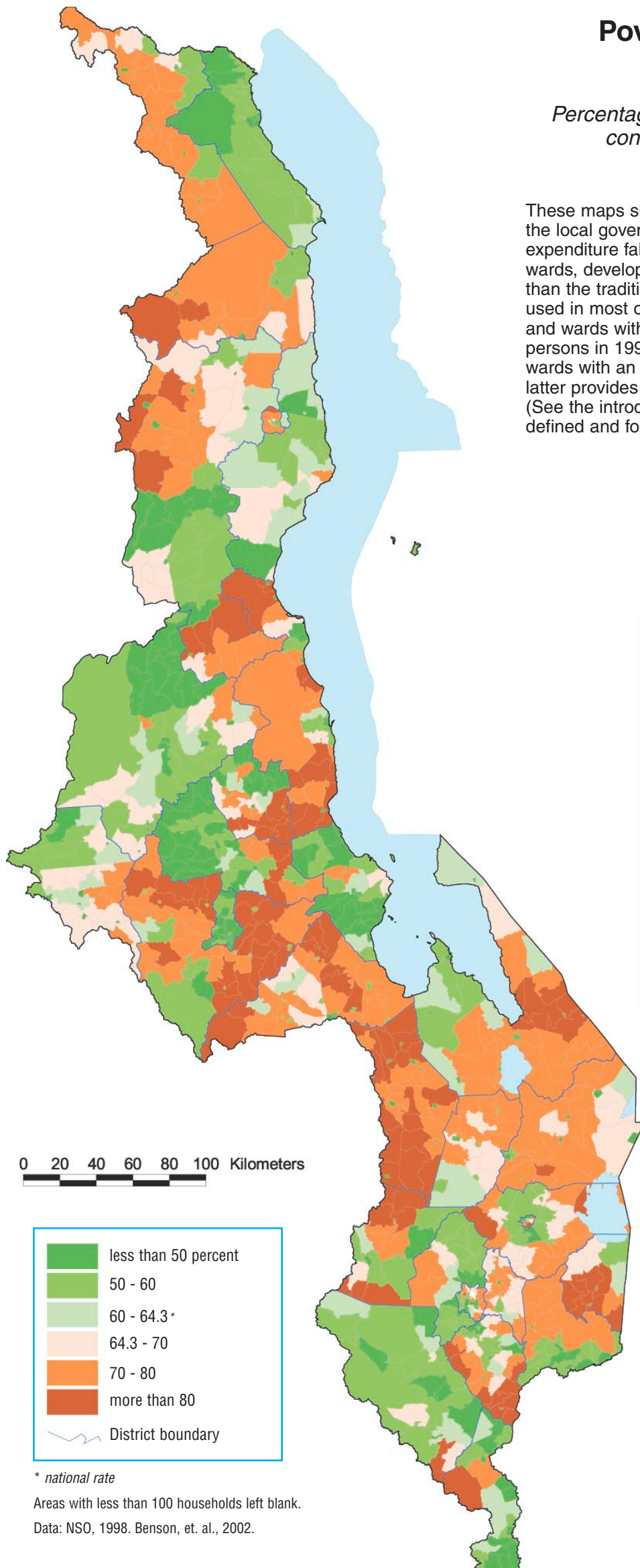
* national rate
 Areas with less than 100 households left blank.
 Data: NSO, 1998. Benson, et al., 2002.

Poverty headcount by local government ward

Percentage of the population whose level of daily consumption is below the poverty line

Malawi 1998

These maps show the proportion of the population at the level of the local government ward for whom daily consumption and expenditure falls below the poverty line. The local government wards, developed in the late 1990s, are considerably smaller than the traditional authorities and urban administrative wards used in most of the other maps. While there are about 380 TAs and wards with an average population of just under 26,000 persons in 1998, there are just under 850 local government wards with an average 1998 population of 11,700 persons. The latter provides a considerably more local assessment of poverty. (See the introduction text to this chapter for how poverty is defined and for a description of the Malawi poverty lines.)



* national rate

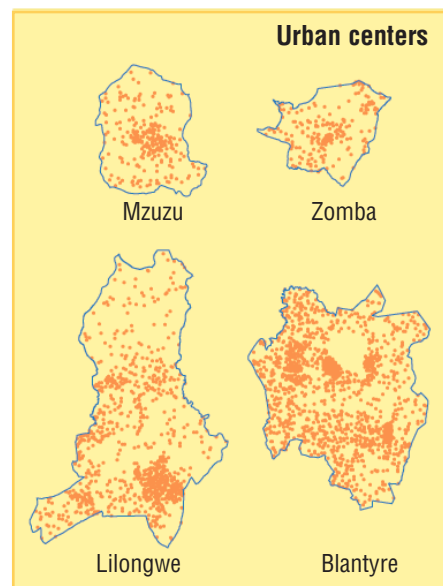
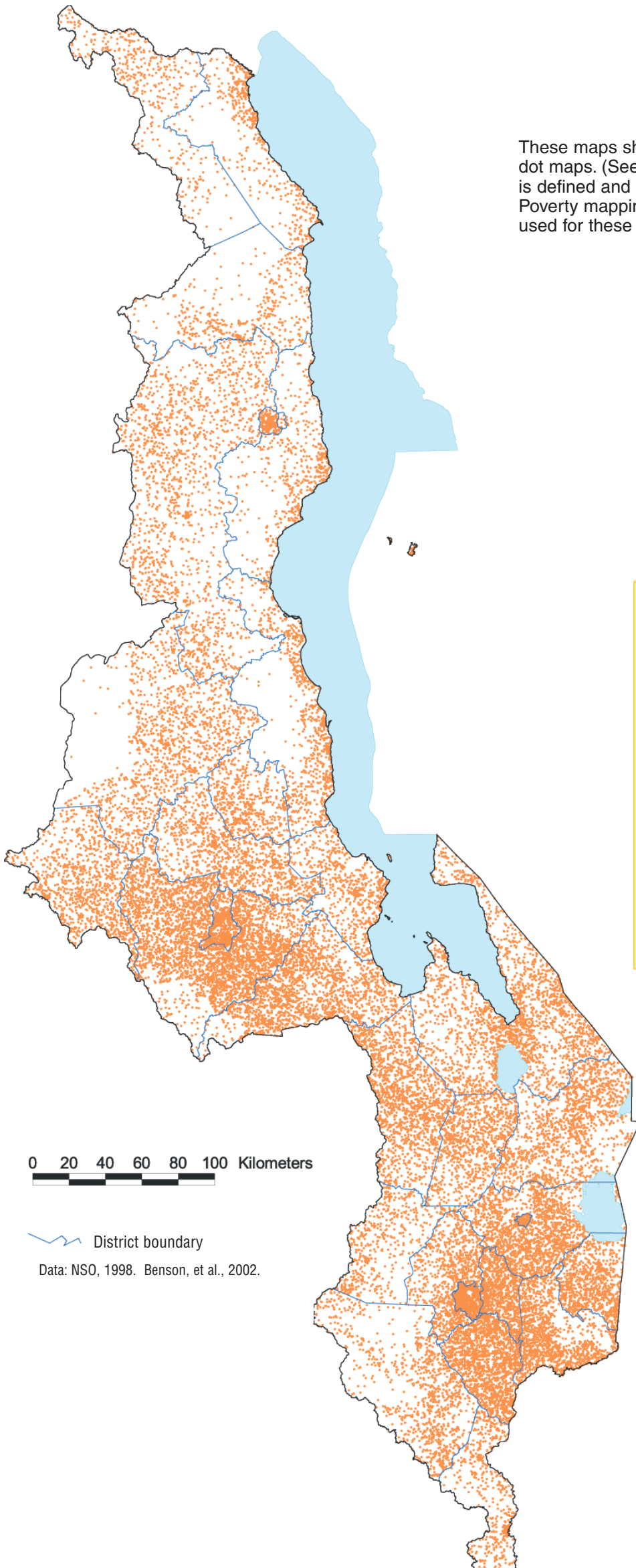
Areas with less than 100 households left blank.

Data: NSO, 1998. Benson, et. al., 2002.

Poverty dot map

One dot= 200 poor persons
Malawi 1998

These maps show the number of poor people across Malawi via dot maps. (See introductory text to this chapter for how poverty is defined and for a description of the Malawi poverty lines.) Poverty mapping estimates for the local government wards were used for these maps.



0 20 40 60 80 100 Kilometers

— District boundary

Data: NSO, 1998. Benson, et al., 2002.

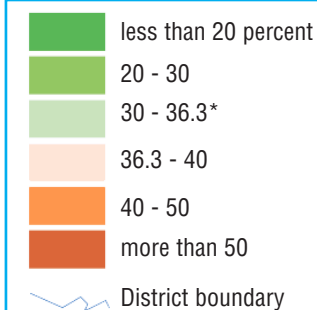
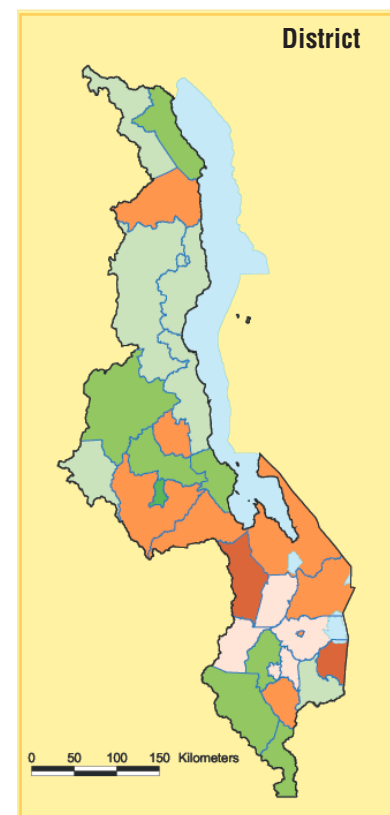
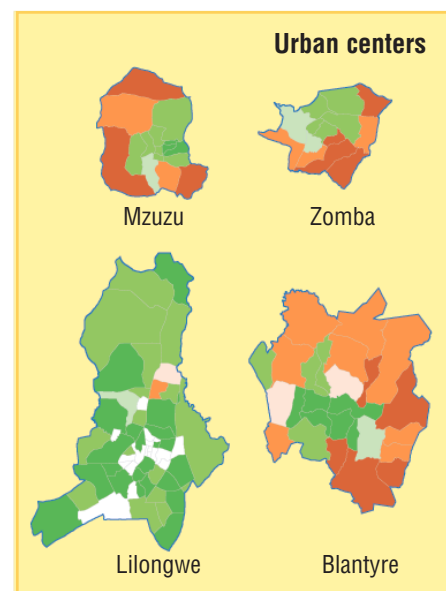
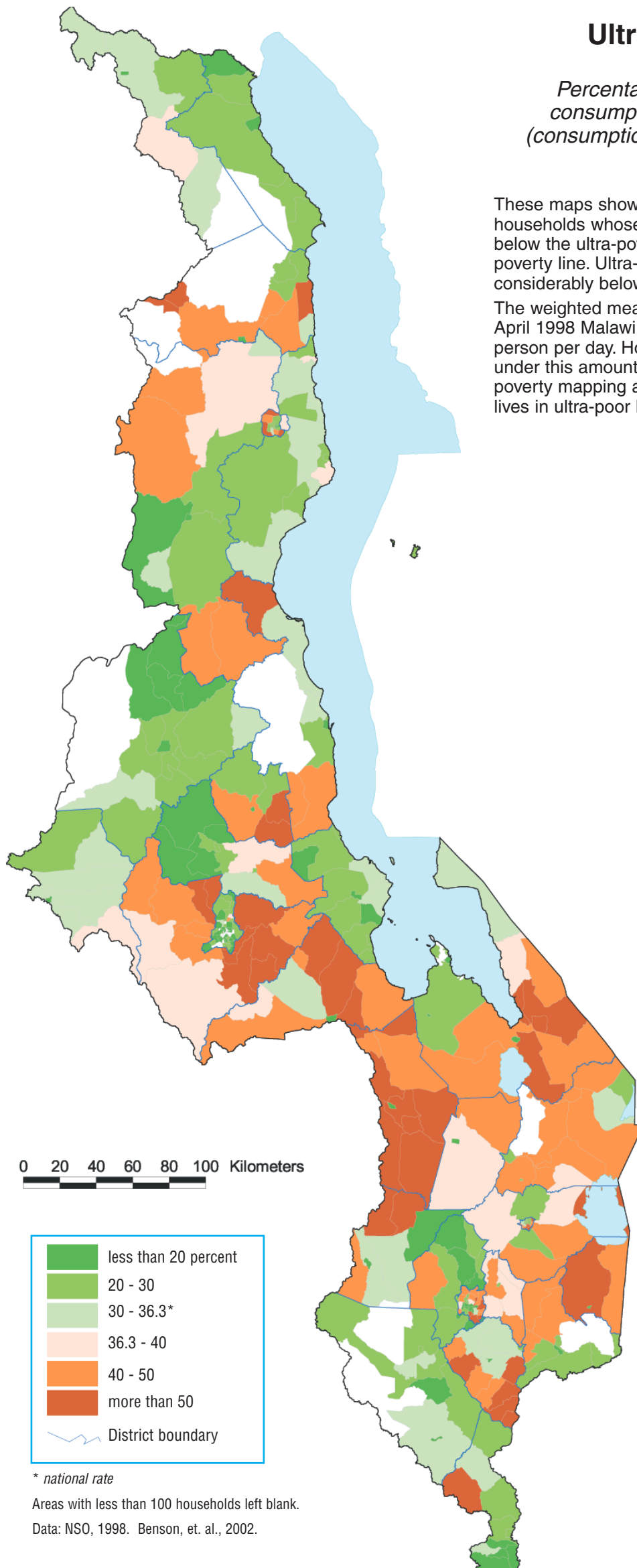
Ultra-poverty headcount

Percentage of the population whose daily consumption is below the ultra-poverty line (consumption less than 60% of the poverty line)

Malawi 1998

These maps show the proportion of the population living in households whose total daily consumption and expenditure falls below the ultra-poverty line, which is set at 60 percent of the poverty line. Ultra-poverty represents a level of material welfare considerably below that at which ones basic needs are met.

The weighted mean ultra-poverty line for the nation as a whole in April 1998 Malawi Kwacha was 6.28, or about 25 U.S. cents per person per day. Households with a per capita daily consumption under this amount are considered "ultra-poor." Based on the poverty mapping analysis, 36.3 percent of Malawi's population lives in ultra-poor households.



* national rate

Areas with less than 100 households left blank.

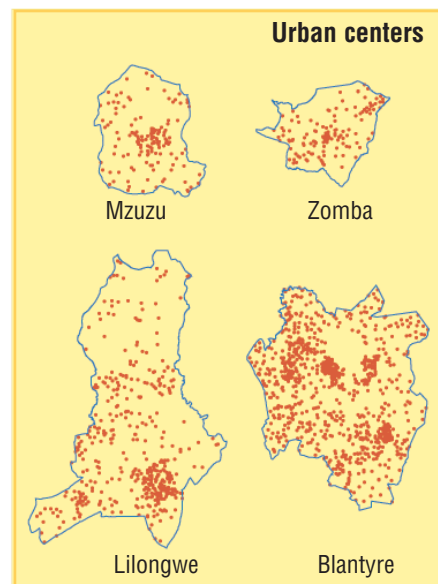
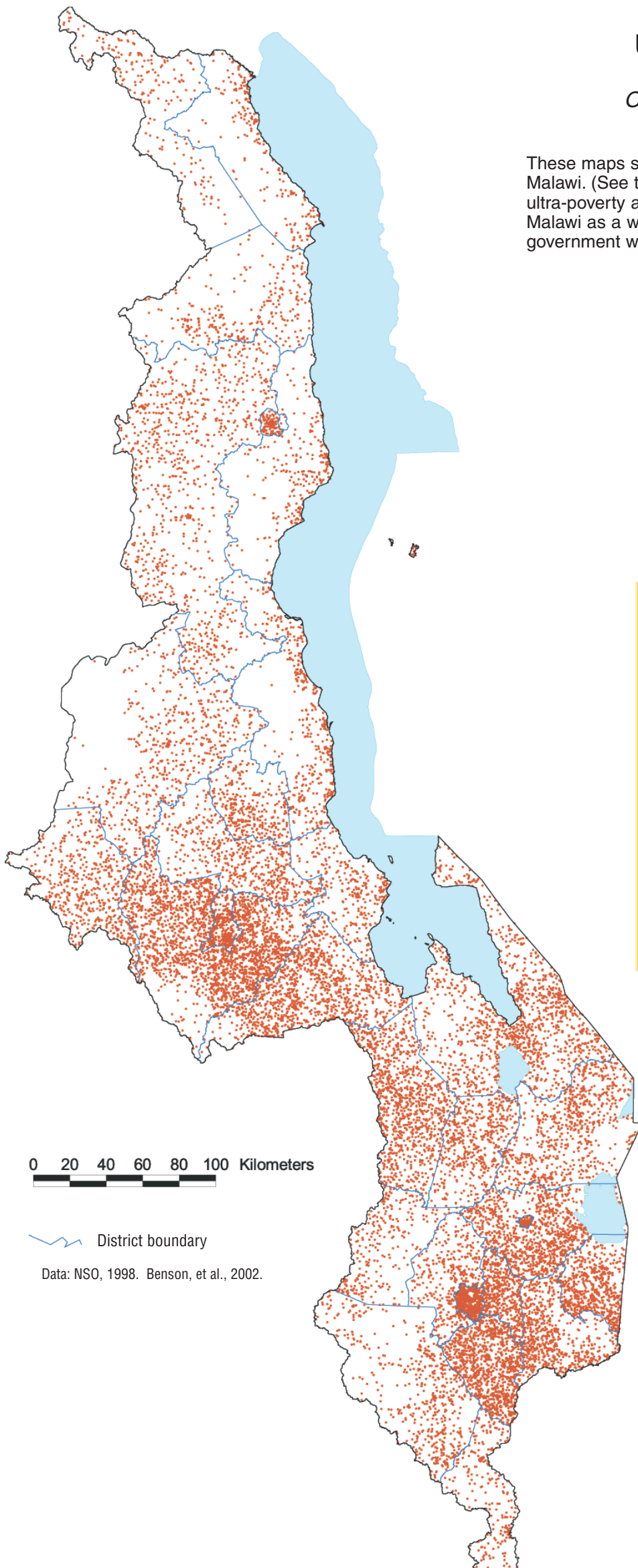
Data: NSO, 1998. Benson, et. al., 2002.

Ultra-poverty dot map

One dot = 200 ultra-poor persons

Malawi 1998

These maps show the number of ultra-poor people across Malawi. (See the text on the previous page for a description of ultra-poverty and the weighted mean ultra-poverty line for Malawi as a whole.) Poverty mapping estimates for local government wards were used for these maps.



0 20 40 60 80 100 Kilometers

~ District boundary

Data: NSO, 1998. Benson, et al., 2002.

Depth of poverty

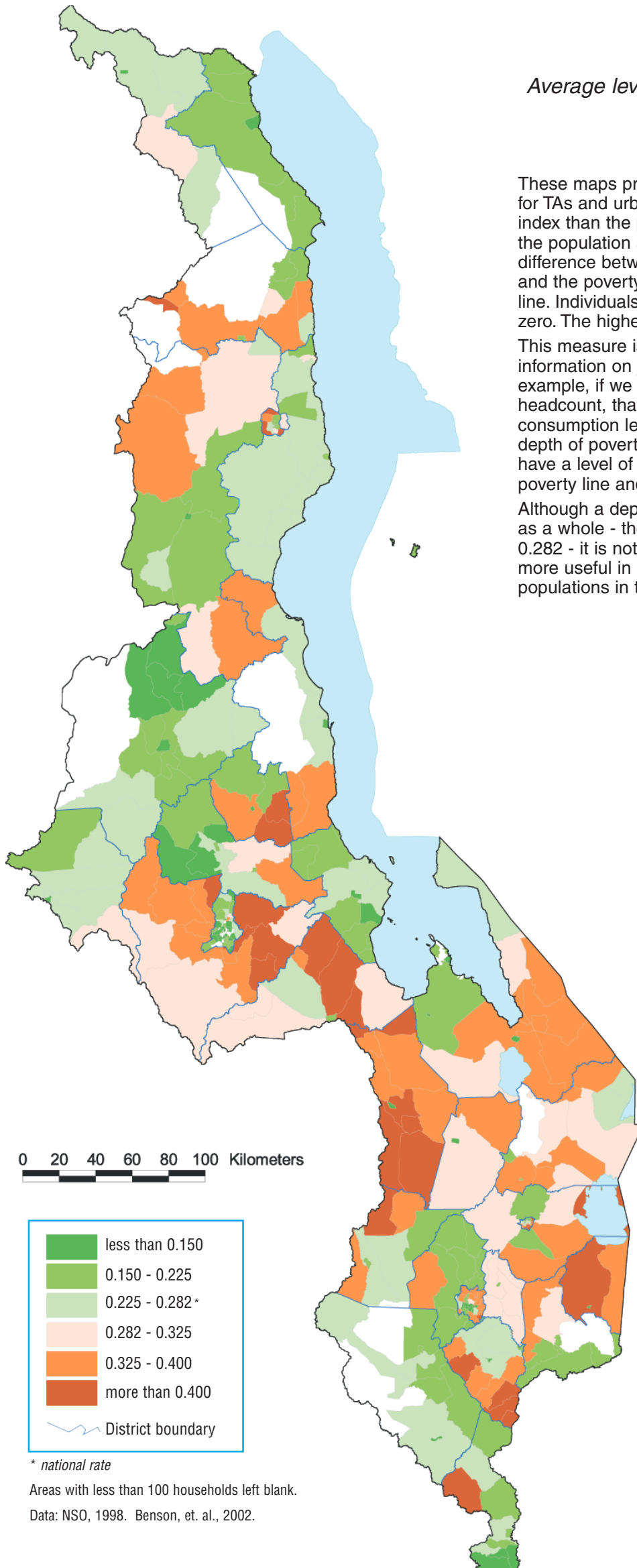
Average level of consumption below the poverty line, as a ratio of the poverty line

Malawi 1998

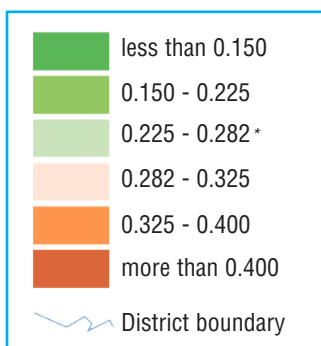
These maps present the depth of poverty, or poverty gap index, for TAs and urban administrative wards. This is a more complex index than the poverty headcount; it is the mean poverty gap for the population as a whole, where the poverty gap is the difference between individual consumption levels in households and the poverty line, expressed as a proportion of the poverty line. Individuals in non-poor households have a poverty gap of zero. The higher the index, the deeper the poverty in that area.

This measure is superior to the headcount because it provides information on just how poor the poor in the population are. For example, if we contrast two areas with the same poverty headcount, that area in which all the poor residing there have consumption levels just under the poverty line will have a lower depth of poverty measure than the other area in which the poor have a level of consumption and expenditure well below the poverty line and are far from meeting their own basic needs.

Although a depth of poverty statistic can be computed for Malawi as a whole - the poverty mapping analysis calculated it to be 0.282 - it is not very informative in and of itself. The index is more useful in comparing the depth of poverty for the populations in two or more areas.



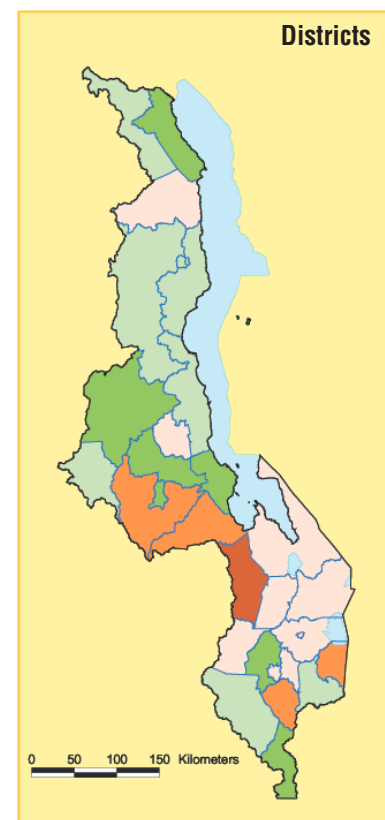
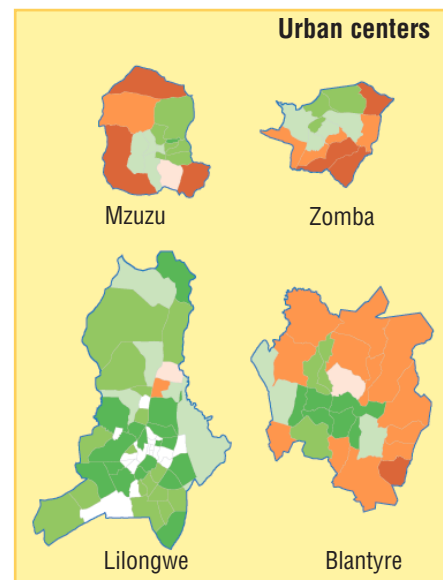
0 20 40 60 80 100 Kilometers



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998. Benson, et. al., 2002.



Severity of poverty

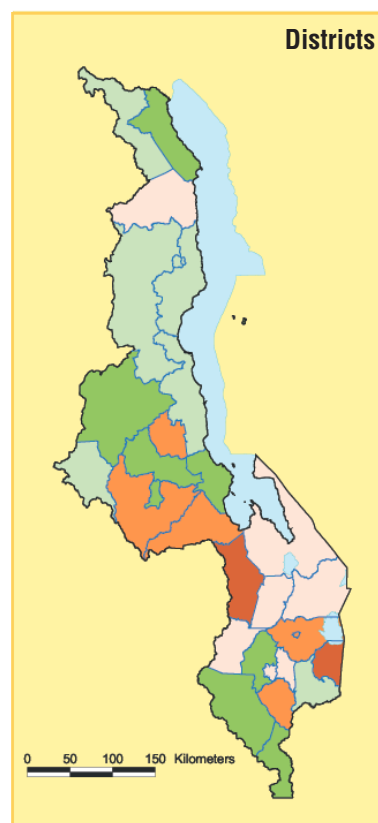
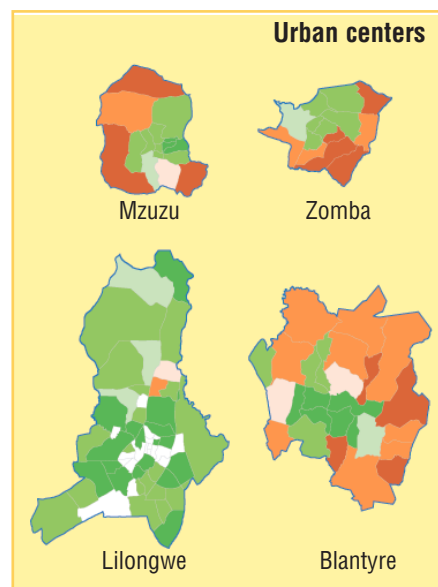
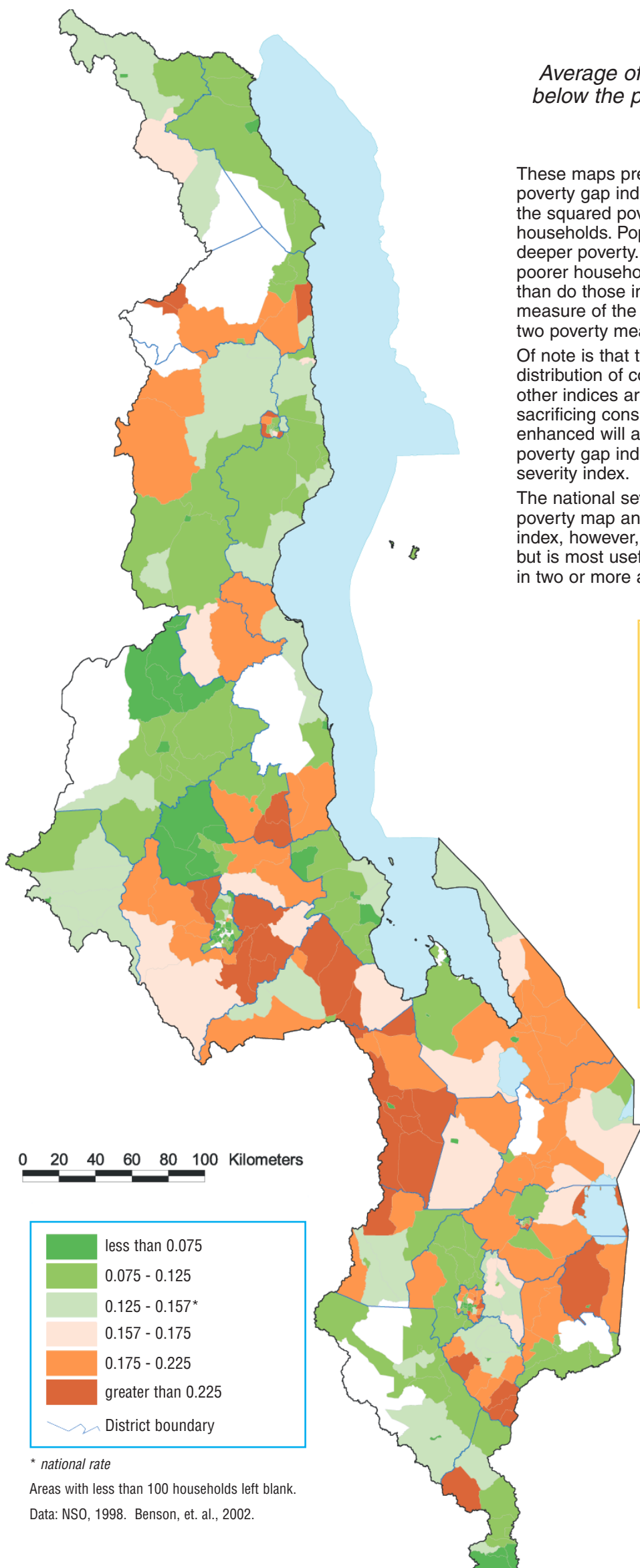
Average of the square of the level of consumption below the poverty line, as a ratio of the poverty line

Malawi 1998

These maps present the severity of poverty or the squared poverty gap index for TAs and wards. This index is the mean of the squared poverty gap index for individuals in poor households. Populations in areas with a higher index have deeper poverty. By squaring the poverty gap index, individuals in poorer households receive greater weight in computing the index than do those in less poor households, resulting in a better measure of the severity of poverty than is provided by the other two poverty measures.

Of note is that the severity of poverty index is sensitive to the distribution of consumption levels among the poor, whereas the other indices are not. What this means is that one poor person sacrificing consumption so that a poorer person's consumption is enhanced will alter neither the poverty headcount nor the poverty gap index; however, this action will decrease the poverty severity index.

The national severity of poverty index as calculated in the poverty map analysis is 0.157. As with the depth of poverty index, however, this index is not very informative in and of itself, but is most useful in comparing the poverty status of populations in two or more areas.



* national rate

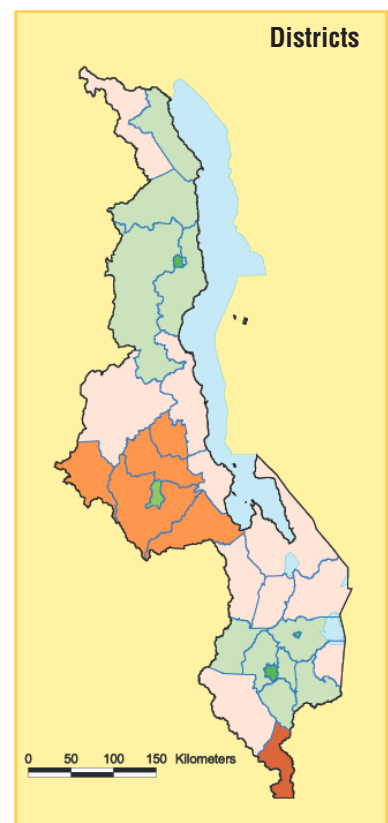
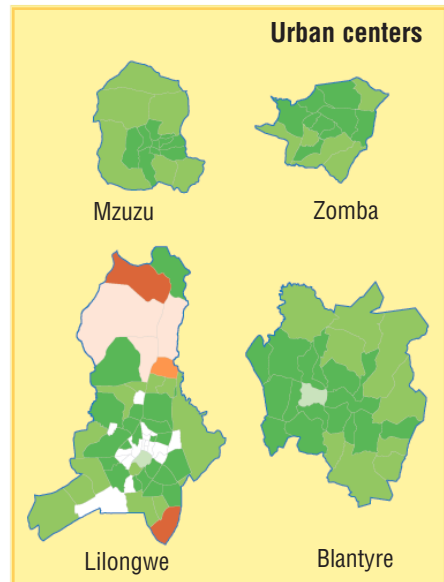
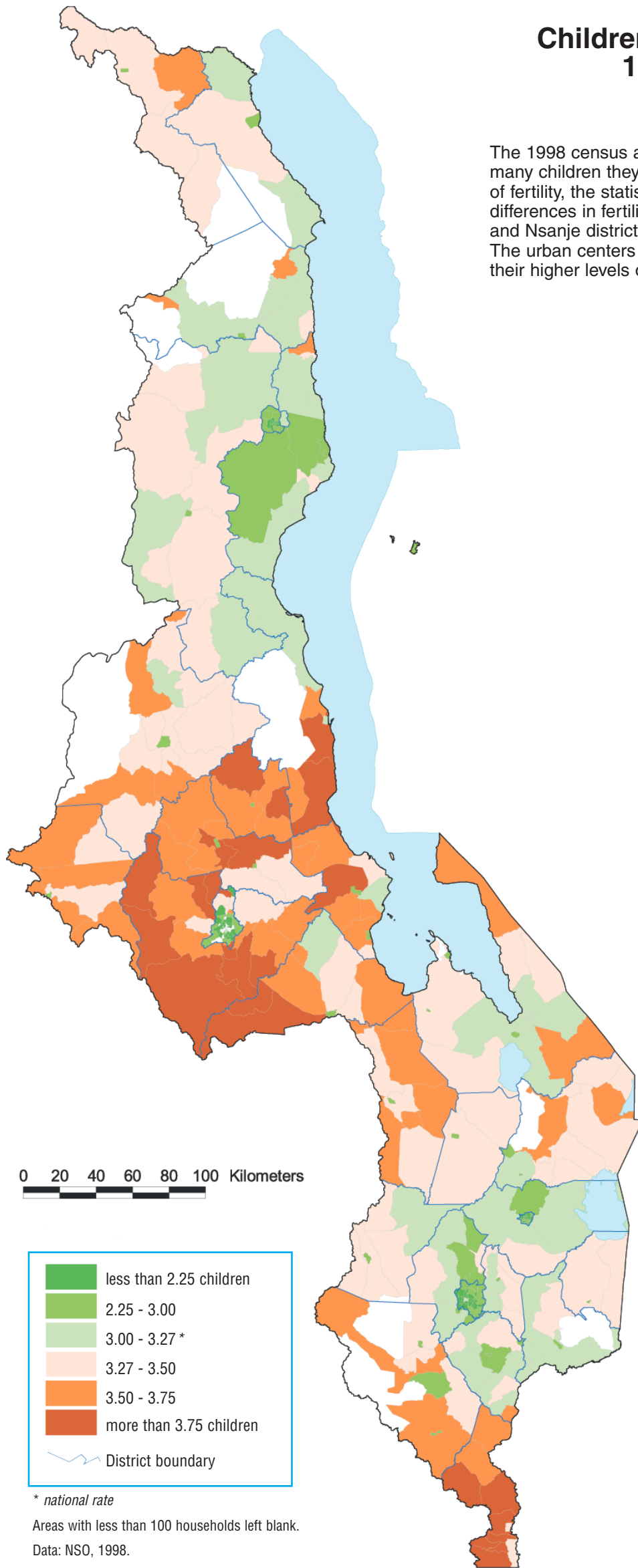
Areas with less than 100 households left blank.

Data: NSO, 1998. Benson, et. al., 2002.

Children born per woman aged 12 years and older

Malawi 1988

The 1998 census asked all women aged 12 years and older how many children they had borne in total. While not the best gauge of fertility, the statistic mapped here provides some indication of differences in fertility levels across Malawi. The central region and Nsanje district are noteworthy for high levels of childbearing. The urban centers have the lowest levels, possibly reflecting their higher levels of unmarried women.



* national rate

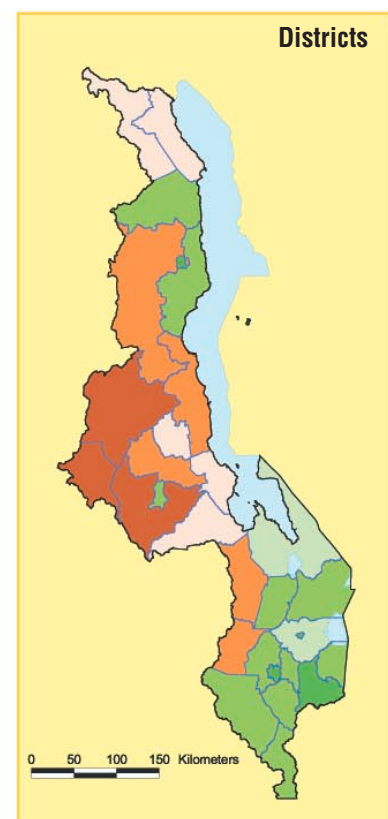
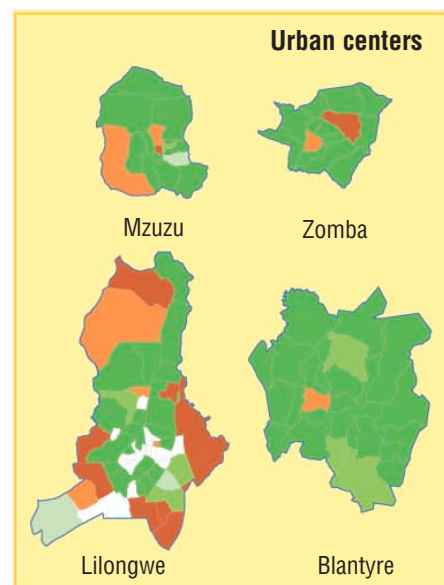
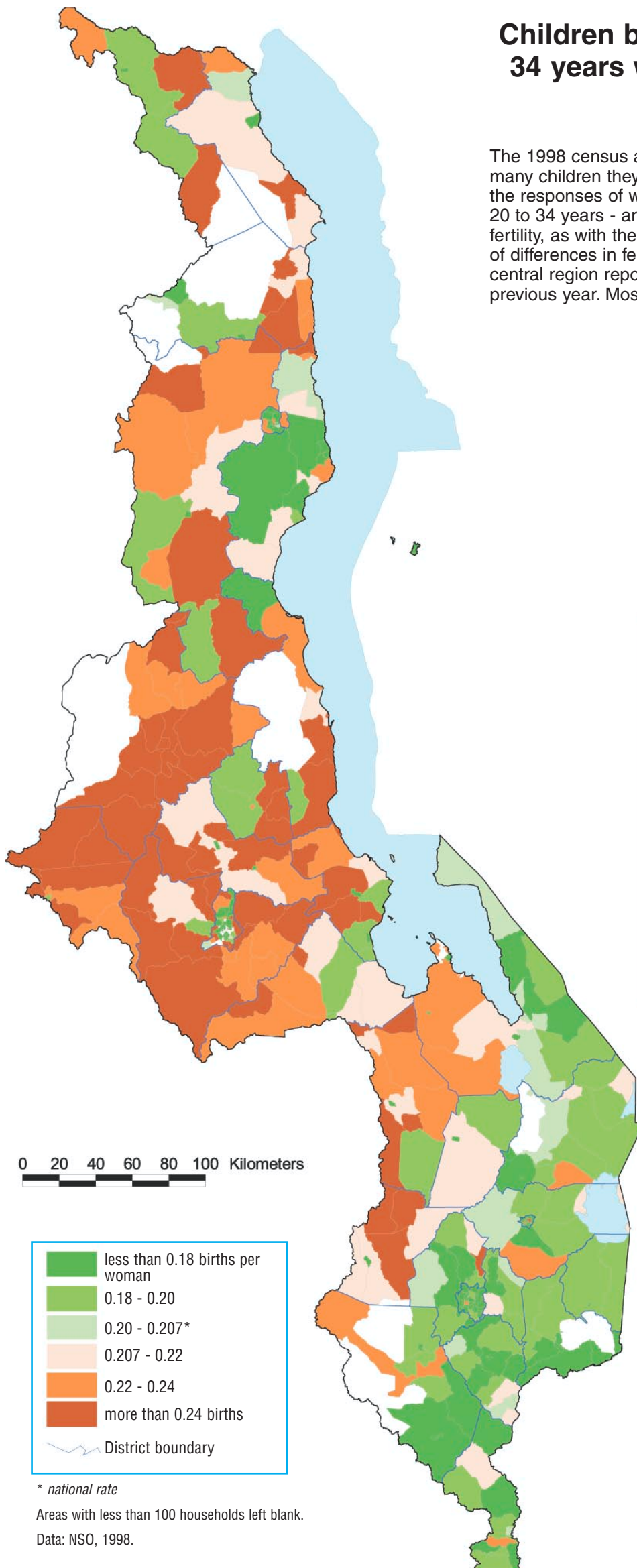
Areas with less than 100 households left blank.

Data: NSO, 1998.

Children born per woman aged 20 to 34 years within the past 12 months

Malawi 1998

The 1998 census asked all women aged 12 years and older how many children they had borne in the previous 12 months. Here the responses of women during the peak years of fertility - ages 20 to 34 years - are considered. While not the best gauge of fertility, as with the previous map, it does provide some indication of differences in fertility levels across Malawi. Women in the central region reported the highest levels of childbearing over the previous year. Most other areas have notably lower rates.



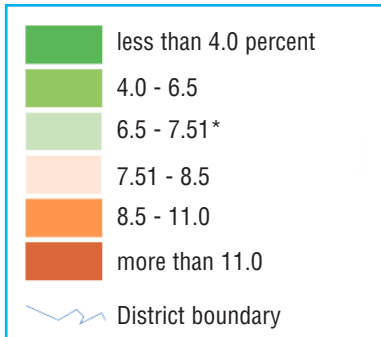
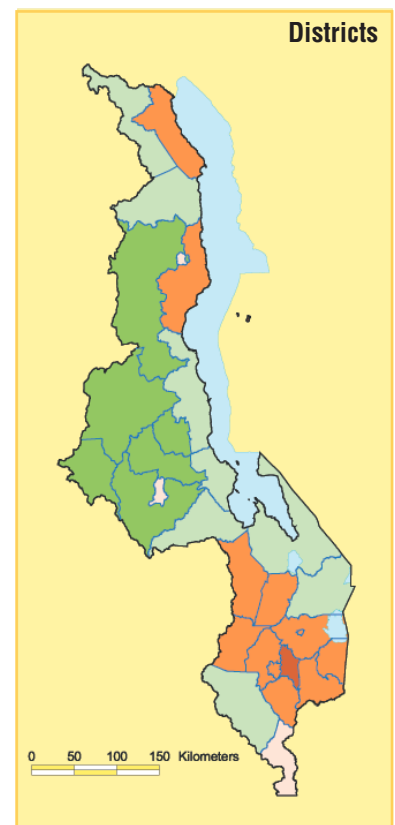
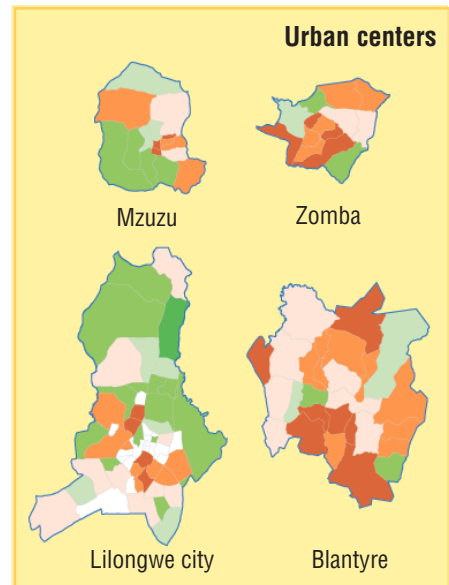
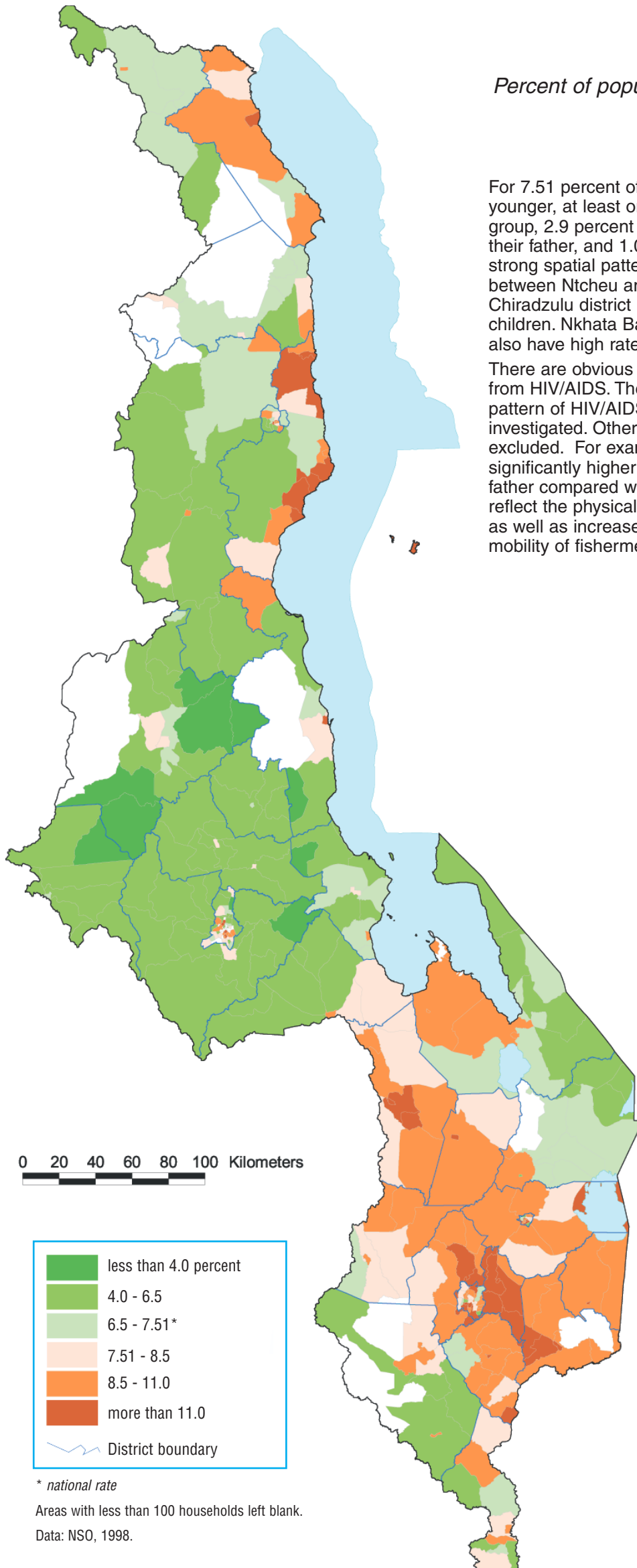
Orphanhood

Percent of population aged 14 years or less having at least one parent dead

Malawi 1998

For 7.51 percent of all Malawian children aged 14 years and younger, at least one of their parents is deceased. For this age group, 2.9 percent have lost their mother, 5.6 percent have lost their father, and 1.0 percent have lost both parents. There is a strong spatial pattern to the rate of orphanhood, with the districts between Ntcheu and Mulanje showing quite high rates, and Chiradzulu district having the greatest proportion of orphaned children. Nkhata Bay, Likoma, and Karonga districts in the north also have high rates.

There are obvious associations between orphanhood and deaths from HIV/AIDS. The pattern shown in these maps may reflect the pattern of HIV/AIDS hot spots in Malawi, but this needs to be investigated. Other causes for the spatial pattern should not be excluded. For example, the northern lakeshore districts have a significantly higher proportion of children who have lost their father compared with those who have lost their mother. This may reflect the physical dangers faced by fishermen on Lake Malawi, as well as increased exposure to HIV infection through the mobility of fishermen in the area.



* national rate

Areas with less than 100 households left blank.

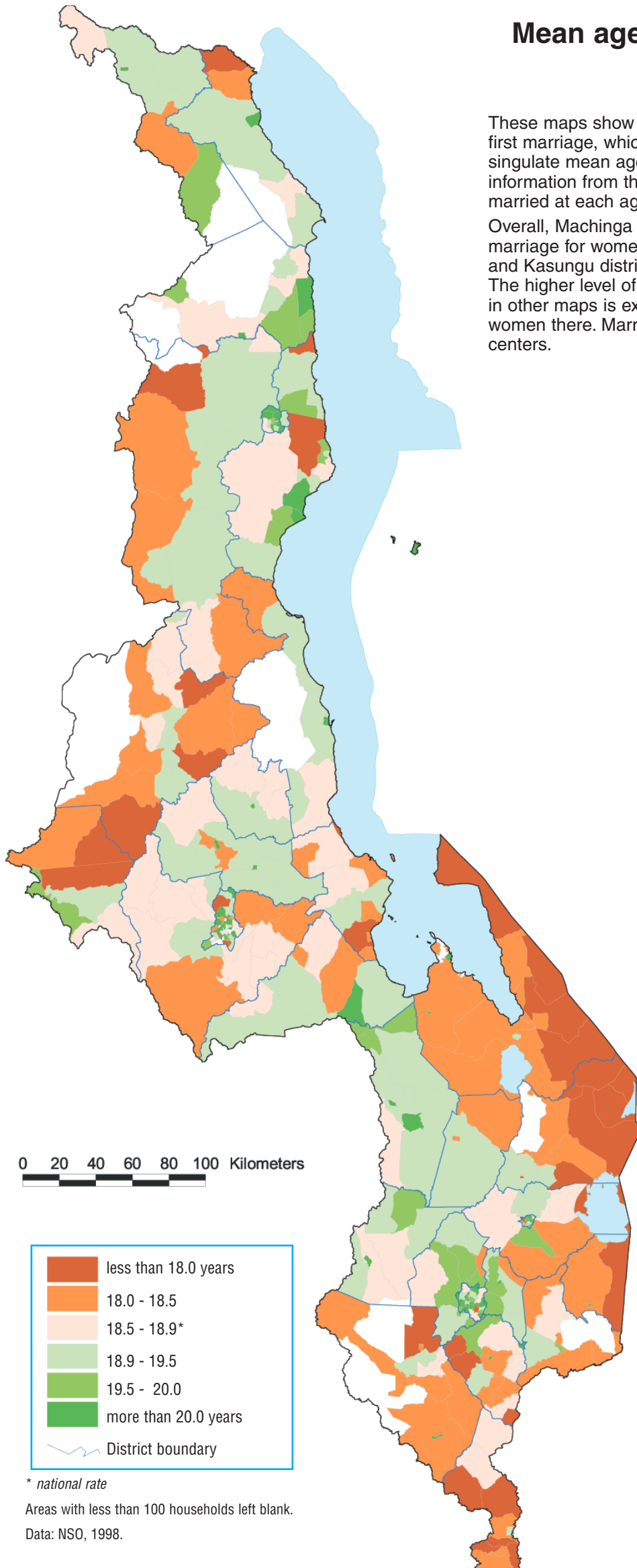
Data: NSO, 1998.

Mean age at first marriage, women

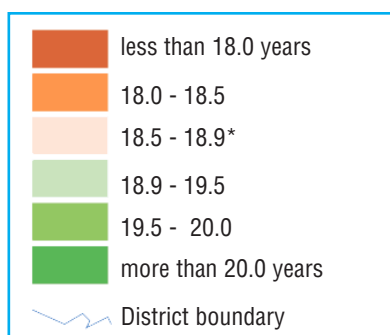
Malawi 1998

These maps show the mean age of Malawian women at their first marriage, which is 18.9 years. This statistic, called the singulate mean age at first marriage, is calculated using information from the 1998 census on the proportion of women married at each age from 15 to 50 years.

Overall, Machinga district has the earliest mean age of first marriage for women, although Mangochi, the lower Shire valley, and Kasungu districts also see women marrying relatively young. The higher level of fertility for Nsanje and Kasungu districts seen in other maps is explained in part by the early marriage of women there. Marriage of women is most delayed in the urban centers.



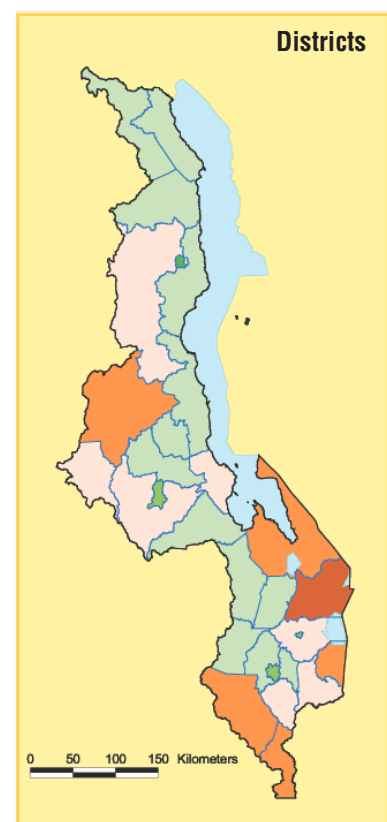
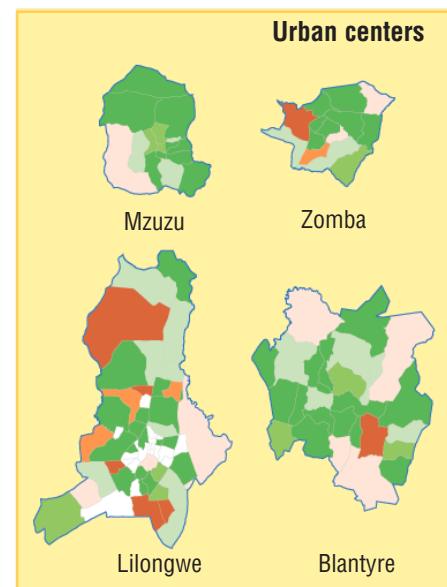
0 20 40 60 80 100 Kilometers



* national rate

Areas with less than 100 households left blank.

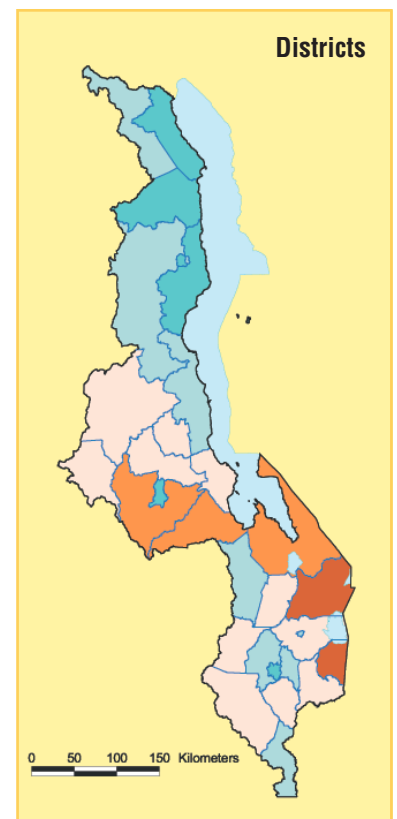
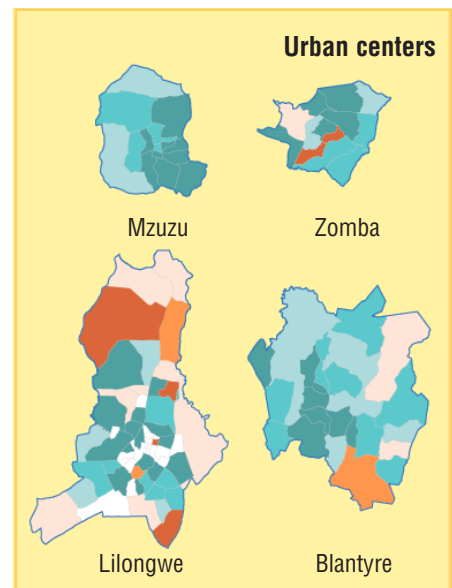
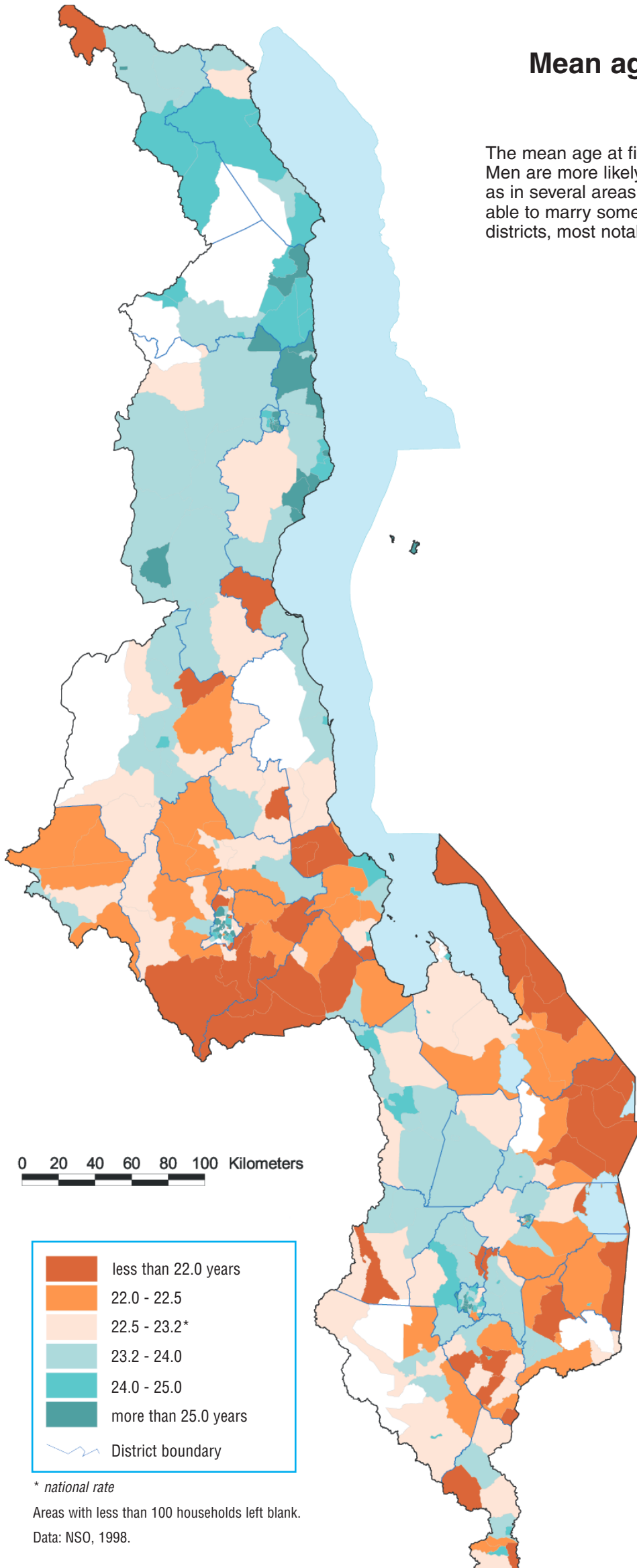
Data: NSO, 1998.



Mean age at first marriage, men

Malawi 1998

The mean age at first marriage for Malawian men is 23.2 years. Men are more likely to marry later in the urban centers as well as in several areas of the northern region. In contrast, men are able to marry somewhat earlier in Machinga and Phalombe districts, most notably.



* national rate

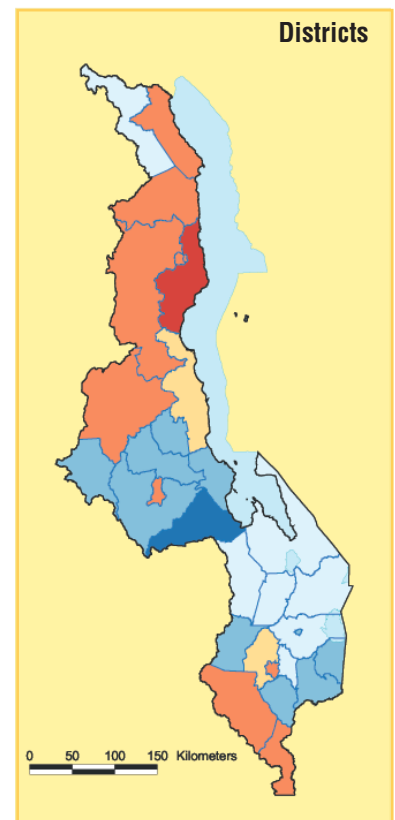
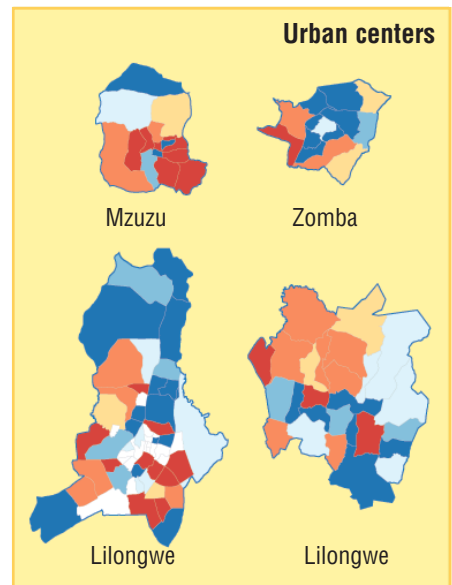
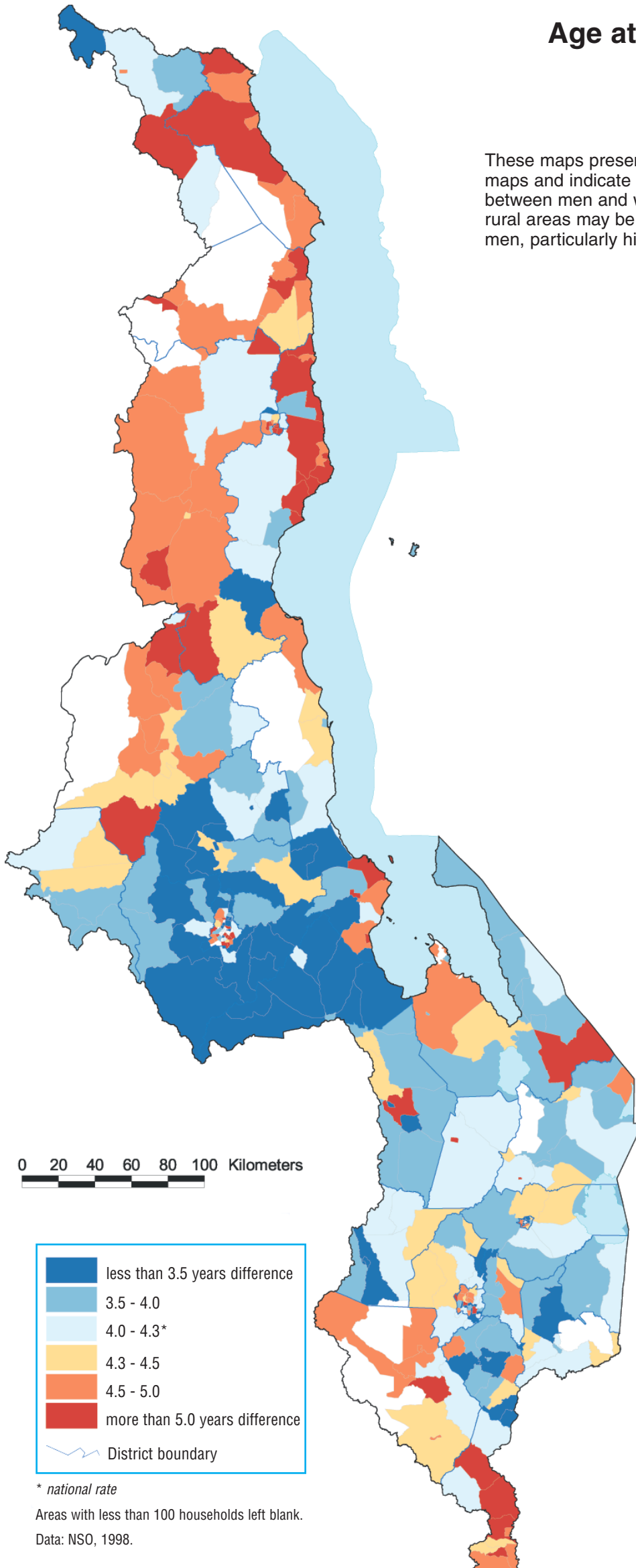
Areas with less than 100 households left blank.

Data: NSO, 1998.

Age at first marriage, gender differences

Malawi 1998

These maps present the difference between the two previous maps and indicate the average age difference at first marriage between men and women. Large gaps in the marriage age in rural areas may be indicative of barriers to early marriage for men, particularly higher bridewealth requirements.

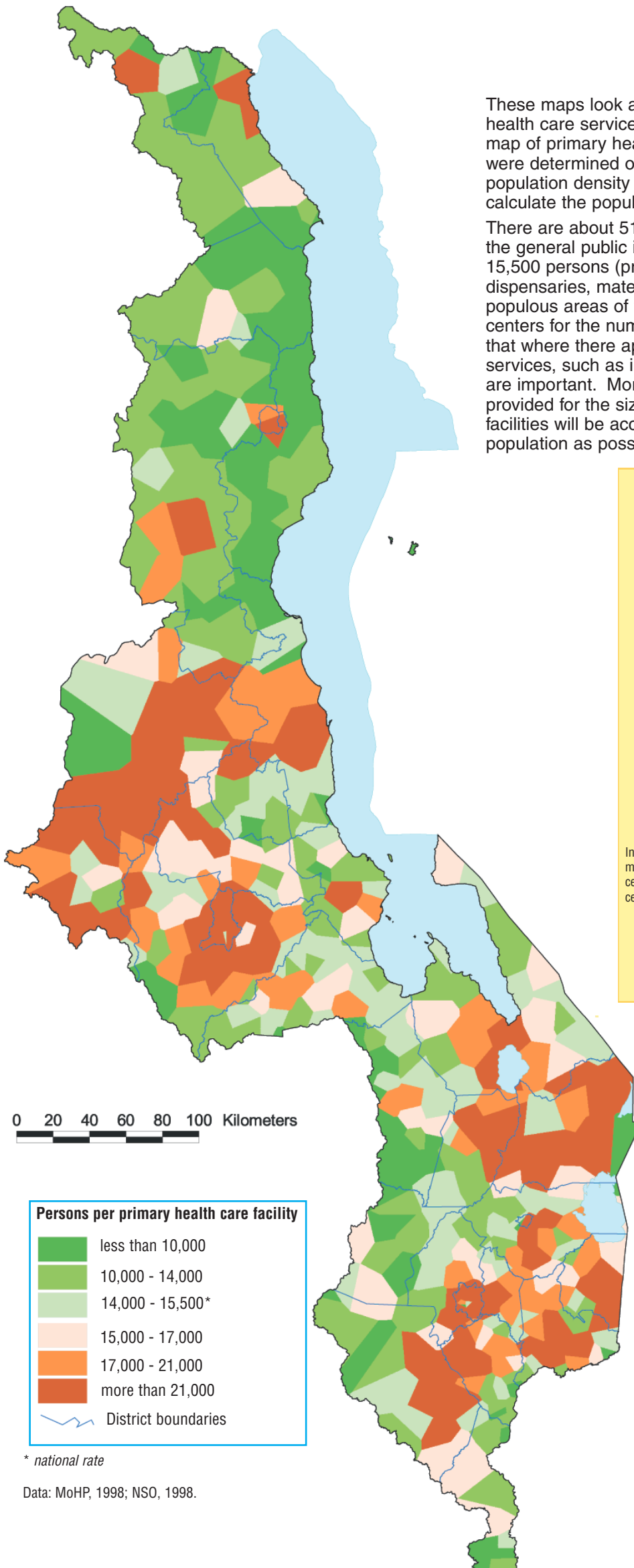


Health facilities

Malawi 1998

These maps look at the provision of publicly accessible primary health care services to the population of Malawi. Using the dot map of primary health care facilities (below), approximations were determined of the area served by each facility. The population density surface map on page 12 was then used to calculate the population residing in areas served by each facility.

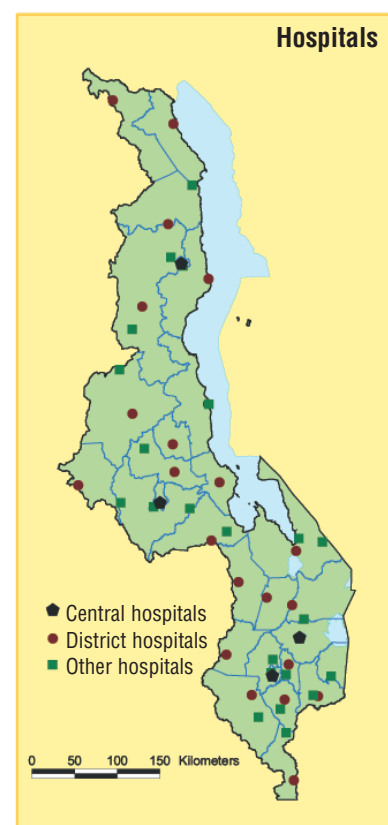
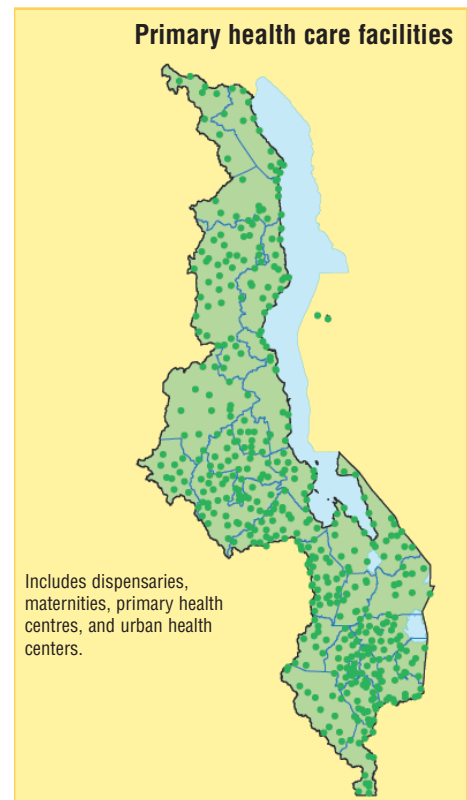
There are about 510 primary health care facilities accessible to the general public in Malawi, each serving an average of about 15,500 persons (primary health care facilities include dispensaries, maternities, and urban health centers). The most populous areas of the country are shown to have fewer health centers for the number of residents. However, one should note that where there appears to be good provision of primary health services, such as in the Northern region, distance considerations are important. More dispensaries and maternities need to be provided for the size of the population there simply so that such facilities will be accessible to as much of the relatively dispersed population as possible.



Persons per primary health care facility	
■	less than 10,000
■	10,000 - 14,000
■	14,000 - 15,500*
■	15,000 - 17,000
■	17,000 - 21,000
■	more than 21,000
—	District boundaries

* national rate

Data: MoHP, 1998; NSO, 1998.

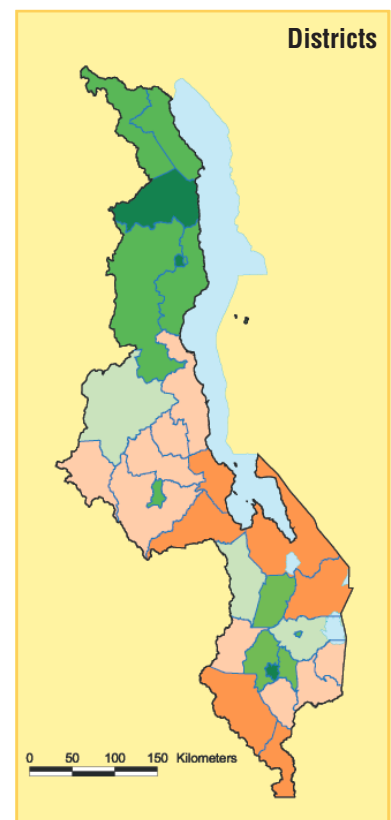
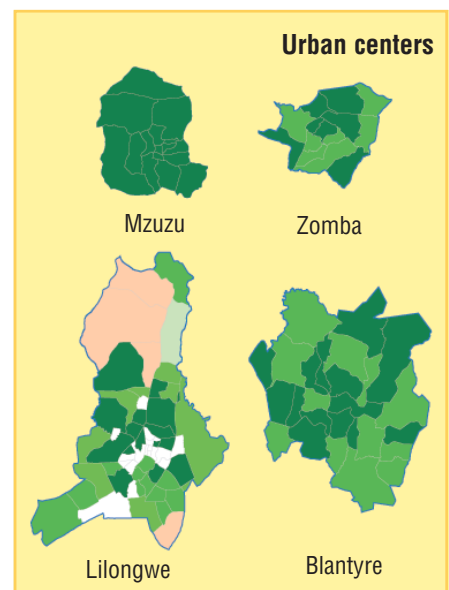
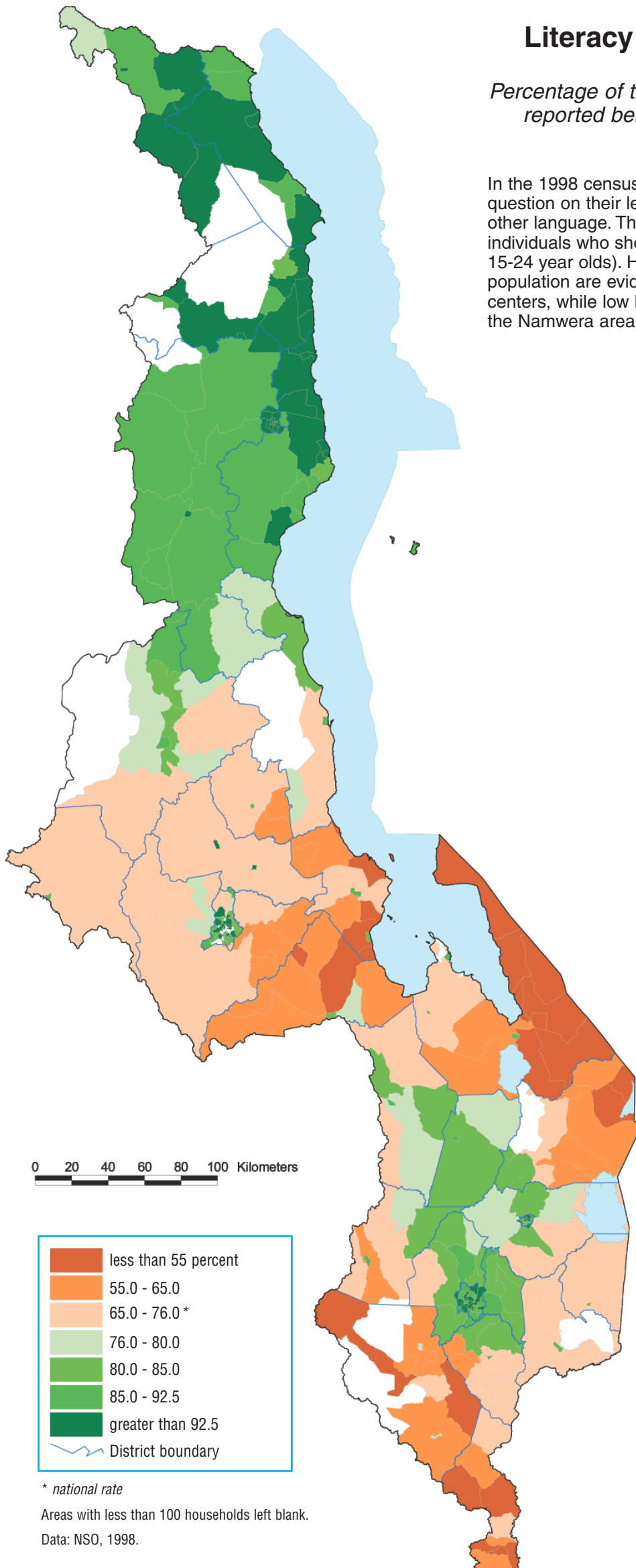


Literacy rates, 15 to 24 year olds

Percentage of the population aged 15 to 24 years that reported being literate in at least one language

Malawi 1998

In the 1998 census, individuals 5 years and older were asked a question on their level of literacy in Chichewa, English, or any other language. These maps show the literacy levels for those individuals who should have just completed schooling (that is, 15-24 year olds). High levels of literacy among this section of the population are evident in the northern region and the urban centers, while low literacy levels arise in Nsanje, Chikwawa, and the Namwera area of Mangochi district.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

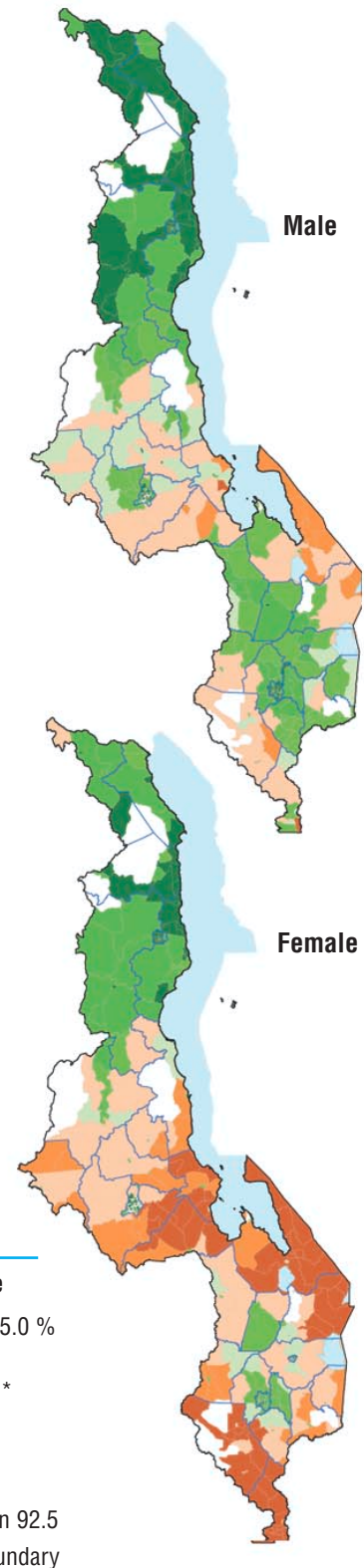
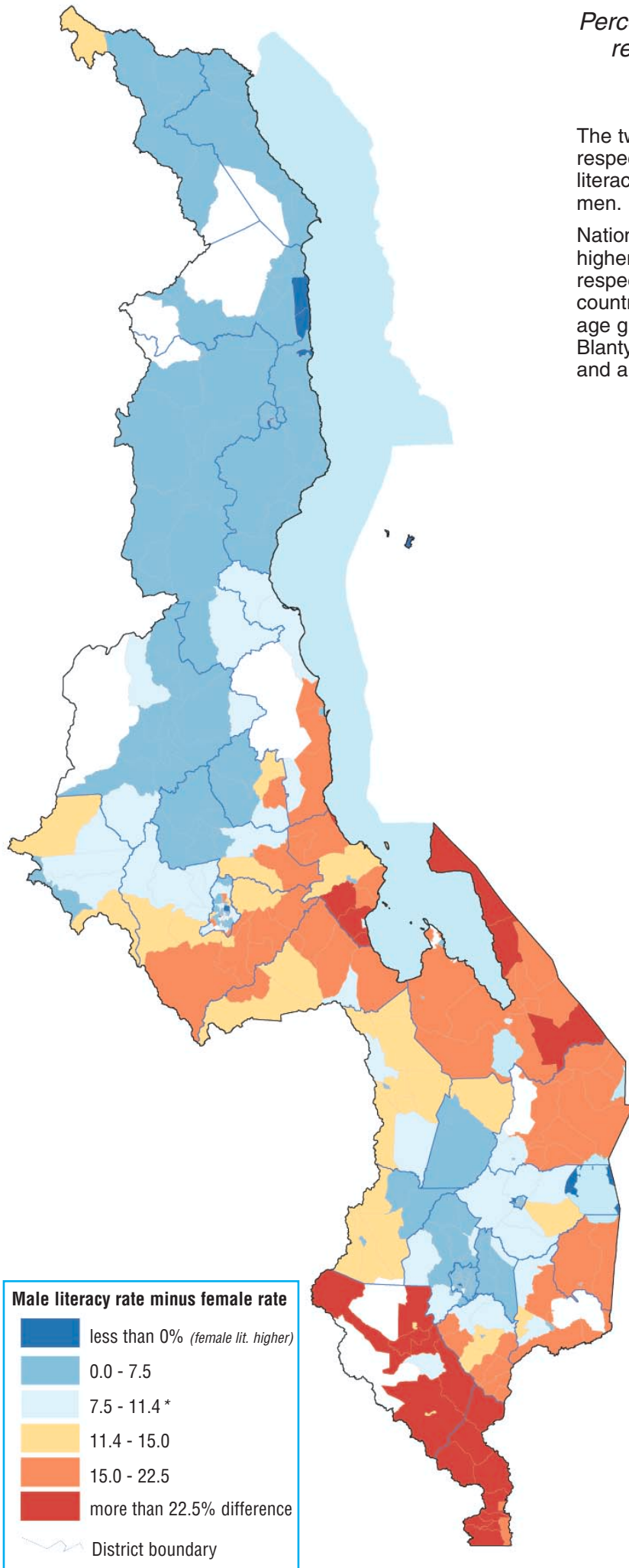
Literacy rates, 15 to 24 year olds, gender differences

Percentage of the population aged 15 to 24 years that reported being literate in at least one language

Malawi 1998

The two small maps show male and female literacy rates, respectively. The large map shows the degree to which the literacy rate from women aged 15 to 24 years is lower than for men.

Nationally, the literacy rate for 15-24 year olds is 11.4 percent higher for men than for women - 82.1 percent and 70.7 percent, respectively - but considerable variation occurs across the country. Differences in literacy rates for men and women of this age group are much less in the northern districts and the Blantyre area than they are in Chikwawa and Nsanje districts and along the southern lakeshore.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

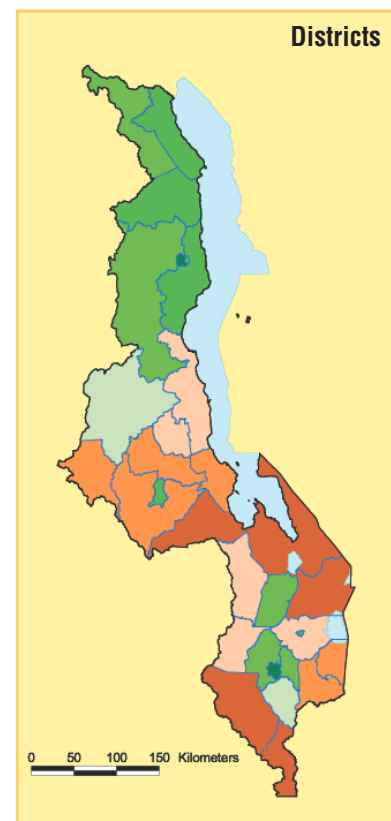
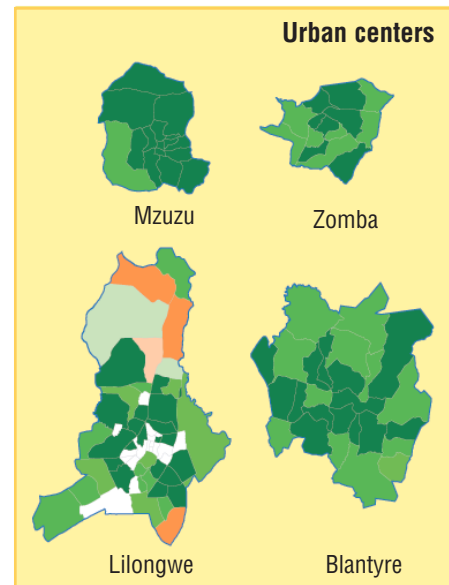
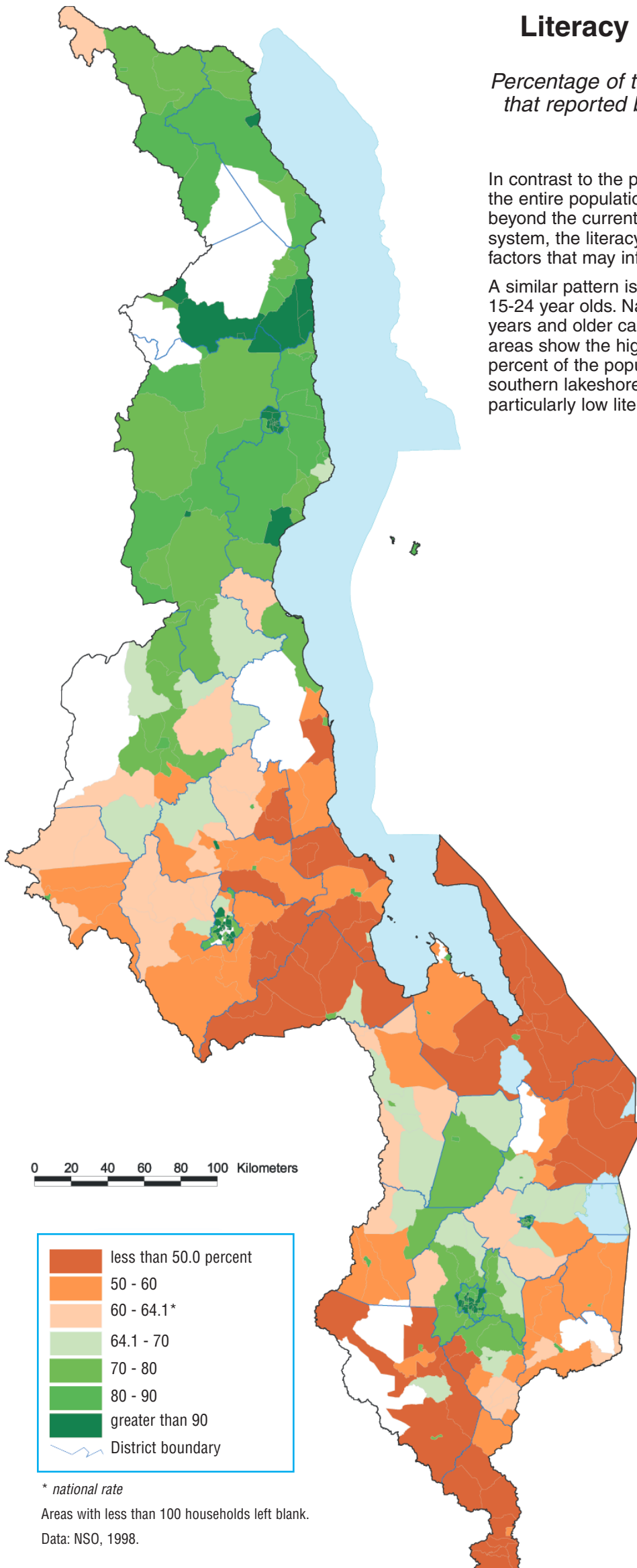
Literacy rates, 15 years and older

Percentage of the population aged 15 years and older that reported being literate in at least one language

Malawi 1998

In contrast to the previous maps on literacy, these maps cover the entire population aged 15 years and older. Consequently, beyond the current effectiveness of the Malawian educational system, the literacy levels here also reflect historical and other factors that may influence literacy levels.

A similar pattern is revealed to that seen in the literacy map for 15-24 year olds. Nationally, 64.1 percent of individuals aged 15 years and older can read. The northern region and the urban areas show the highest literacy, where in many areas over 90 percent of the population in this age range can read. The southern lakeshore and the lower Shire valley are areas of particularly low literacy.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

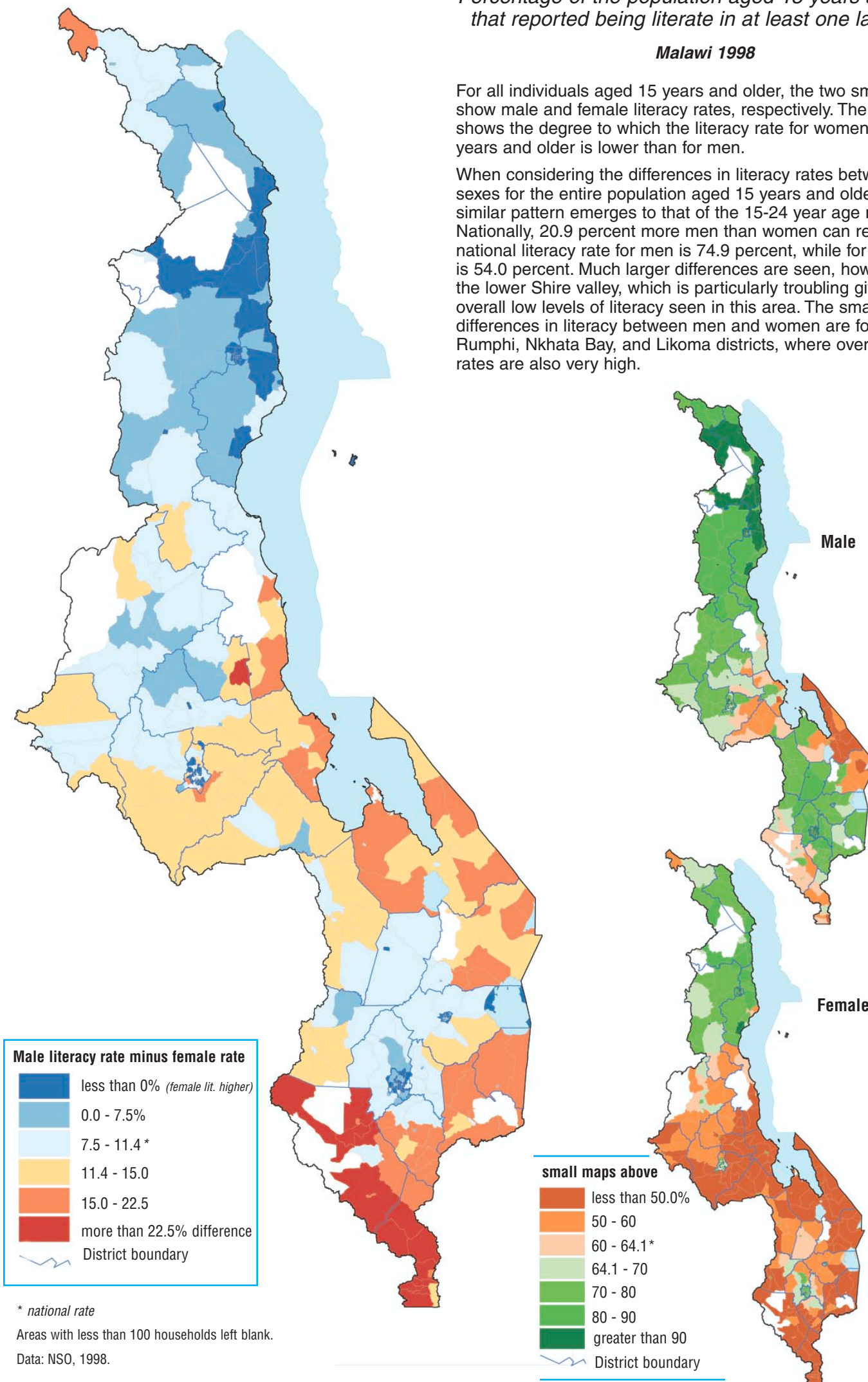
Literacy rates, 15 years and older, gender differences

Percentage of the population aged 15 years and older that reported being literate in at least one language

Malawi 1998

For all individuals aged 15 years and older, the two small maps show male and female literacy rates, respectively. The large map shows the degree to which the literacy rate for women aged 15 years and older is lower than for men.

When considering the differences in literacy rates between the sexes for the entire population aged 15 years and older, a similar pattern emerges to that of the 15-24 year age range. Nationally, 20.9 percent more men than women can read: the national literacy rate for men is 74.9 percent, while for women it is 54.0 percent. Much larger differences are seen, however, in the lower Shire valley, which is particularly troubling given the overall low levels of literacy seen in this area. The smallest differences in literacy between men and women are found in Rumphi, Nkhata Bay, and Likoma districts, where overall literacy rates are also very high.



* national rate

Areas with less than 100 households left blank.

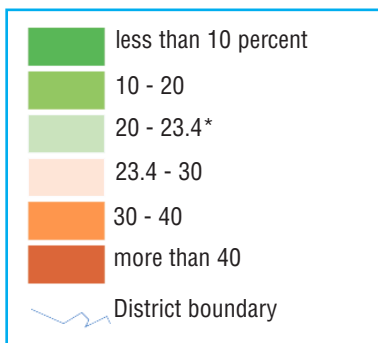
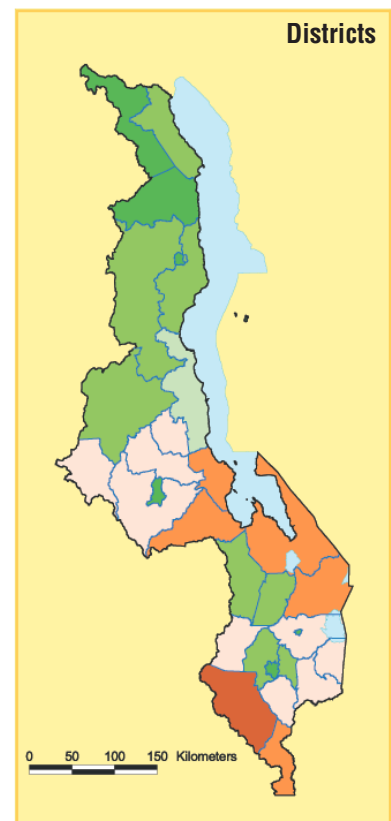
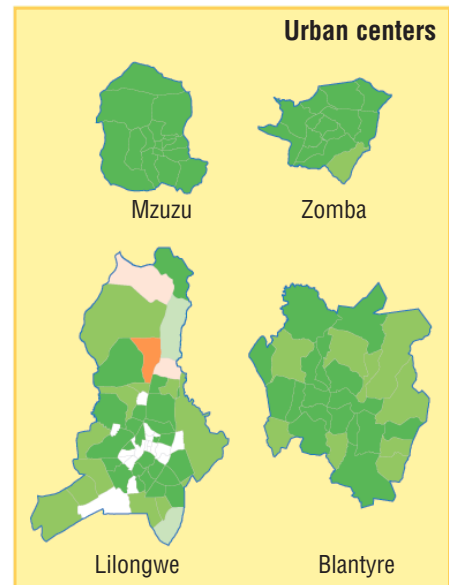
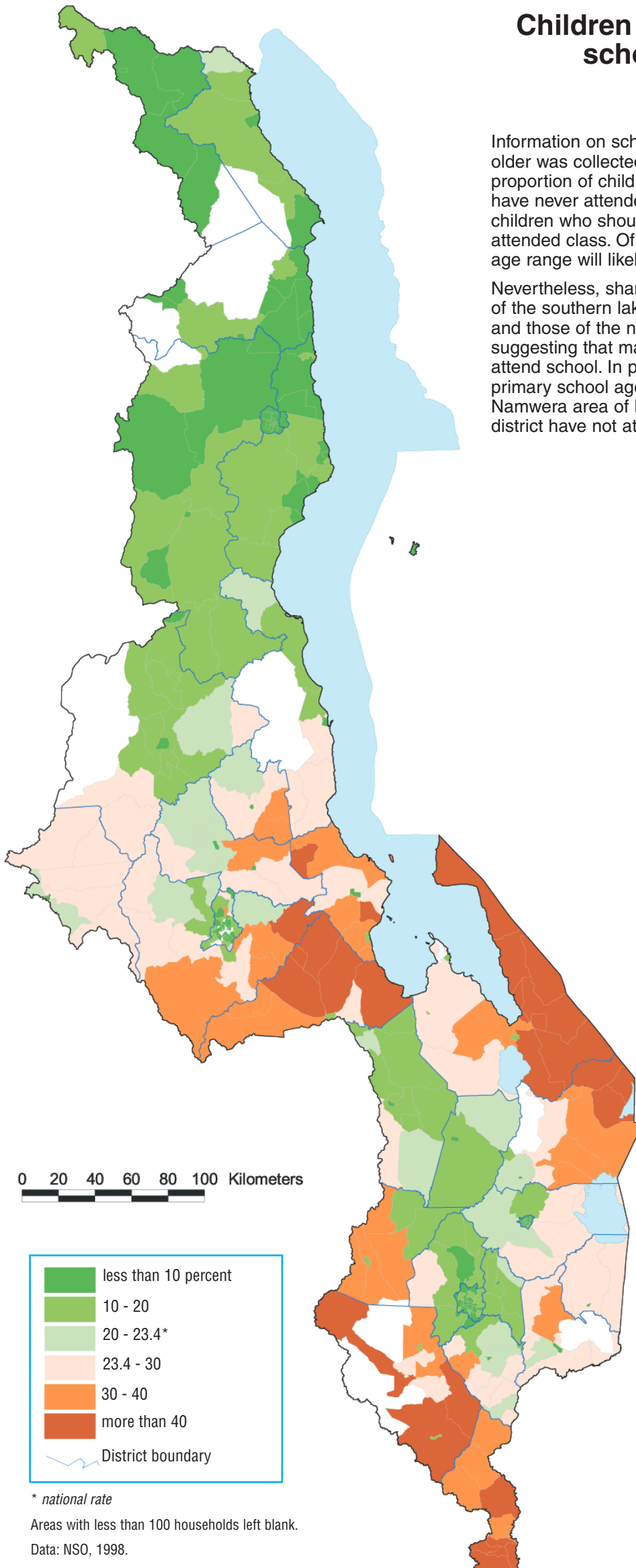
Data: NSO, 1998.

Children who have never attended school, 6 to 13 year olds

Malawi 1998

Information on schooling for all individuals aged 5 years and older was collected in the 1998 census. These maps show the proportion of children of primary school age (6-13 year olds) who have never attended school. Nationally, 23.4 percent of all children who should be attending primary school have never attended class. Of course, many of the younger children in this age range will likely start school by age 7 or 8.

Nevertheless, sharp differences are notable between the areas of the southern lakeshore, Dedza district, and lower Shire valley, and those of the northern region and the urban centers, suggesting that many children in the first grouping will never attend school. In particular, over 40 percent of children of primary school age in much of the Chikwawa district, the Namwera area of Mangochi district, and in the eastern Dedza district have not attended school.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

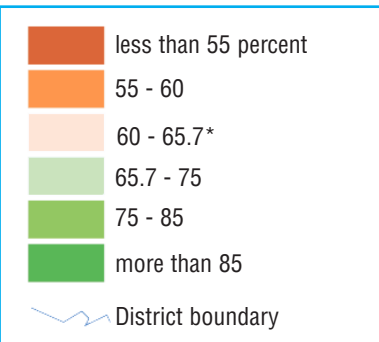
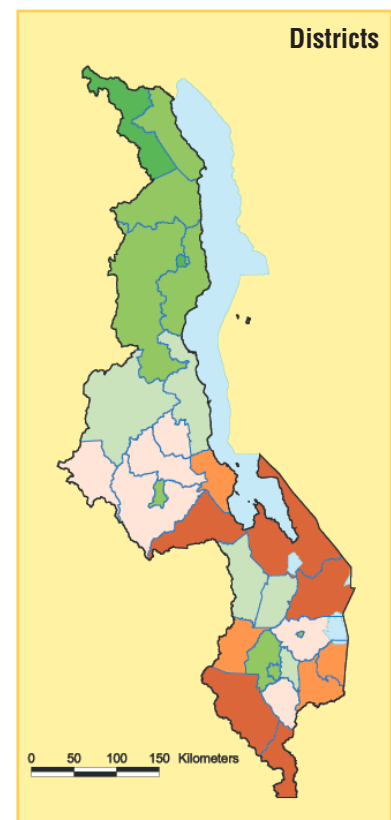
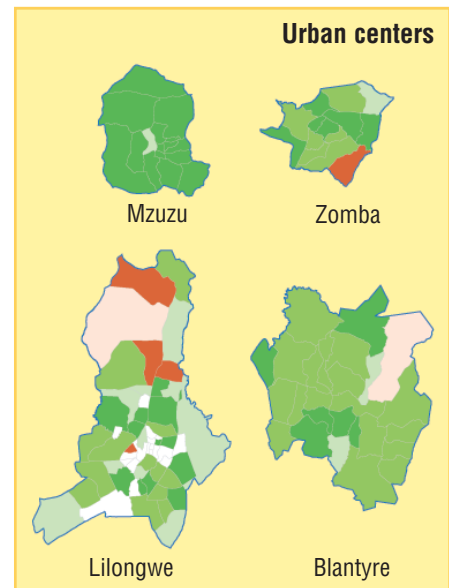
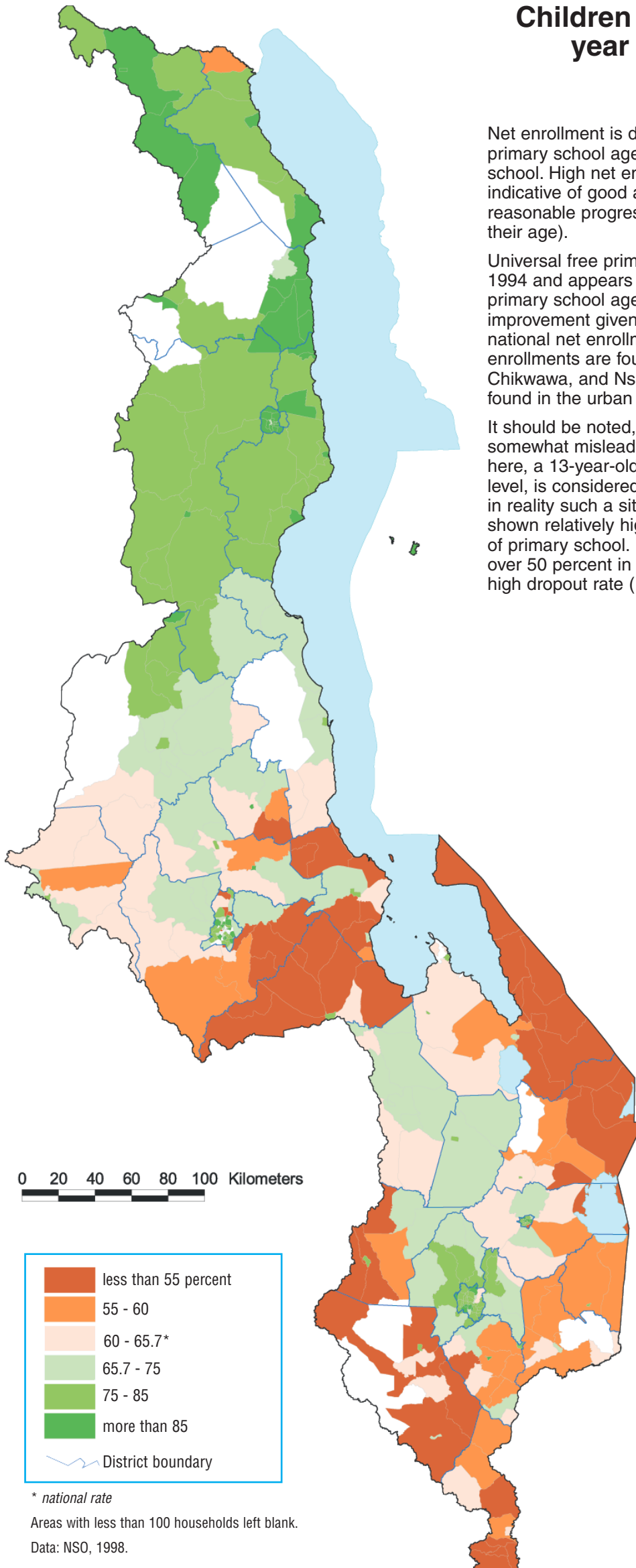
Children attending school, 6 to 13 year olds (net enrollment)

Malawi 1998

Net enrollment is defined as the percentage of children of primary school age (6-13 year olds) actually attending primary school. High net enrollment rates are desired, as they are indicative of good access to schooling for children and reasonable progress (that is, children are in the proper class for their age).

Universal free primary education was introduced to Malawi in 1994 and appears to have made education accessible to most primary school aged children. However, there is still room for improvement given that, according to the 1998 census, the national net enrollment rate is 65.7 percent. Much lower net enrollments are found in Dedza, Mangochi, Machinga, Chikwawa, and Nsanje Districts, while high net enrollments are found in the urban centers, and in the north of the country.

It should be noted, moreover, that the enrollment rates are somewhat misleading: According to the official definition used here, a 13-year-old child in Standard 1, the lowest primary class level, is considered to be in the proper class for their age, when in reality such a situation is undesirable. Other analyses have shown relatively high net enrollment rates for the first four years of primary school. However, thereafter rates decline sharply by over 50 percent in the latter four years of primary, reflecting a high dropout rate (PMS, 2001).



* national rate

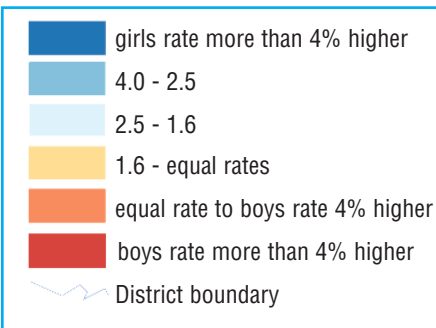
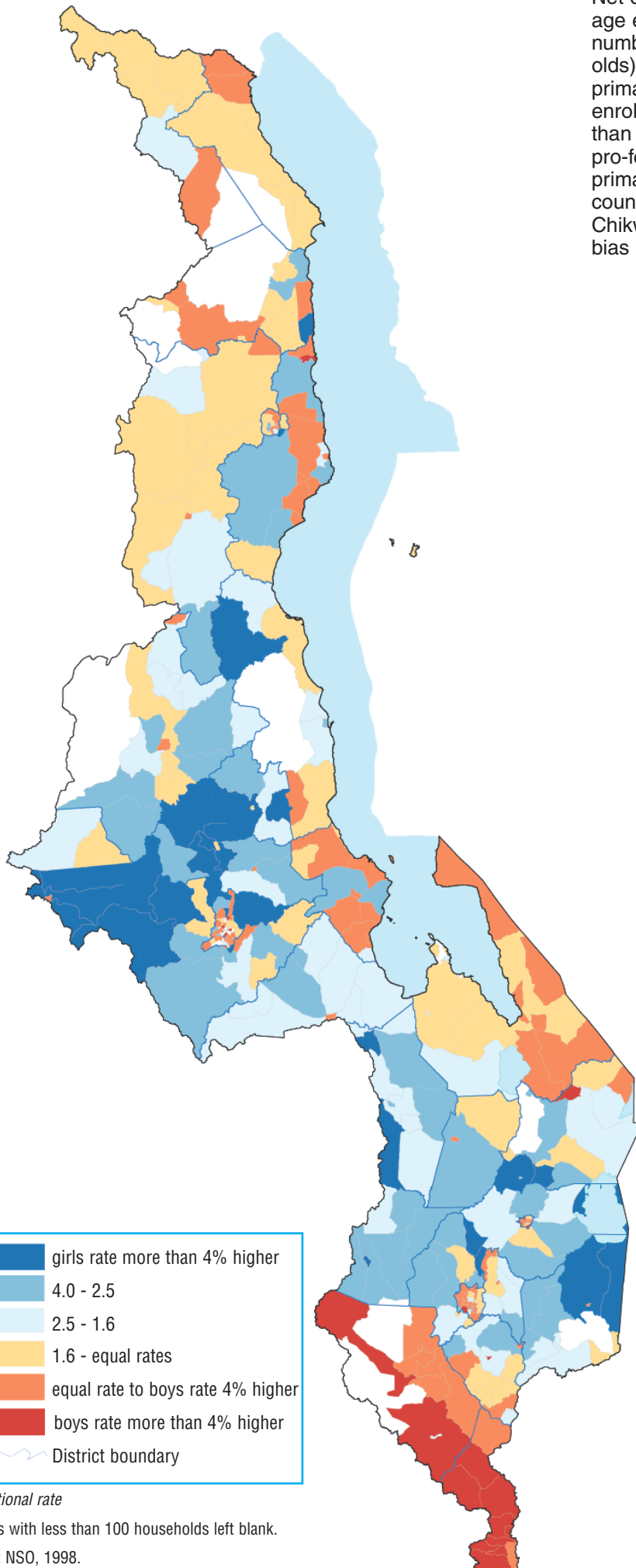
Areas with less than 100 households left blank.

Data: NSO, 1998.

Net enrollment, 6 to 13 year olds, gender differences

Malawi 1998

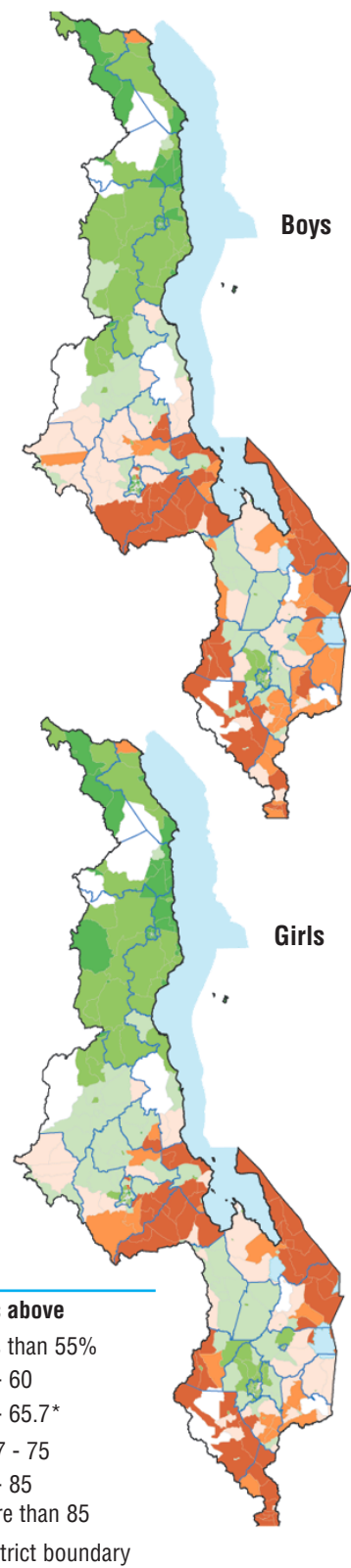
Net enrollment is the proportion of children of primary school age enrolled in primary school as a percentage of the total number of children of primary school age (that is, 6-13 year olds). Nationally, 6-13 year old girls are more likely to be in primary school than are boys of the same age: the net enrollment rate for girls, at 66.5 percent, is 1.6 percent higher than the rate for boys. The central region is noteworthy for its pro-female bias, where in many areas 4.5 percent more girls of primary school age attend school compared with their male counterparts. Conversely, the lower Shire valley district of Chikwawa and Nsanje are noteworthy for their strong pro-male bias in primary school attendance.



* national rate

Areas with less than 100 households left blank.

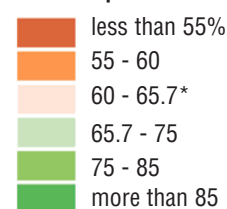
Data: NSO, 1998.



Boys

Girls

small maps above



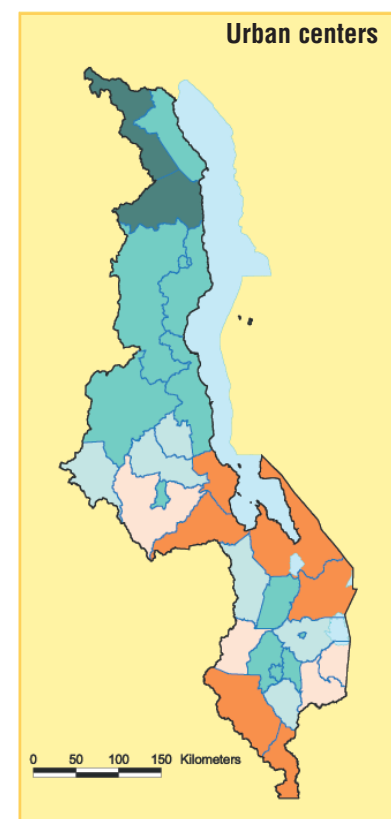
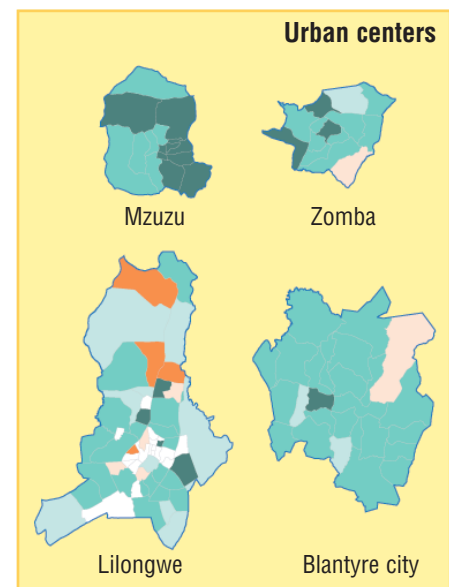
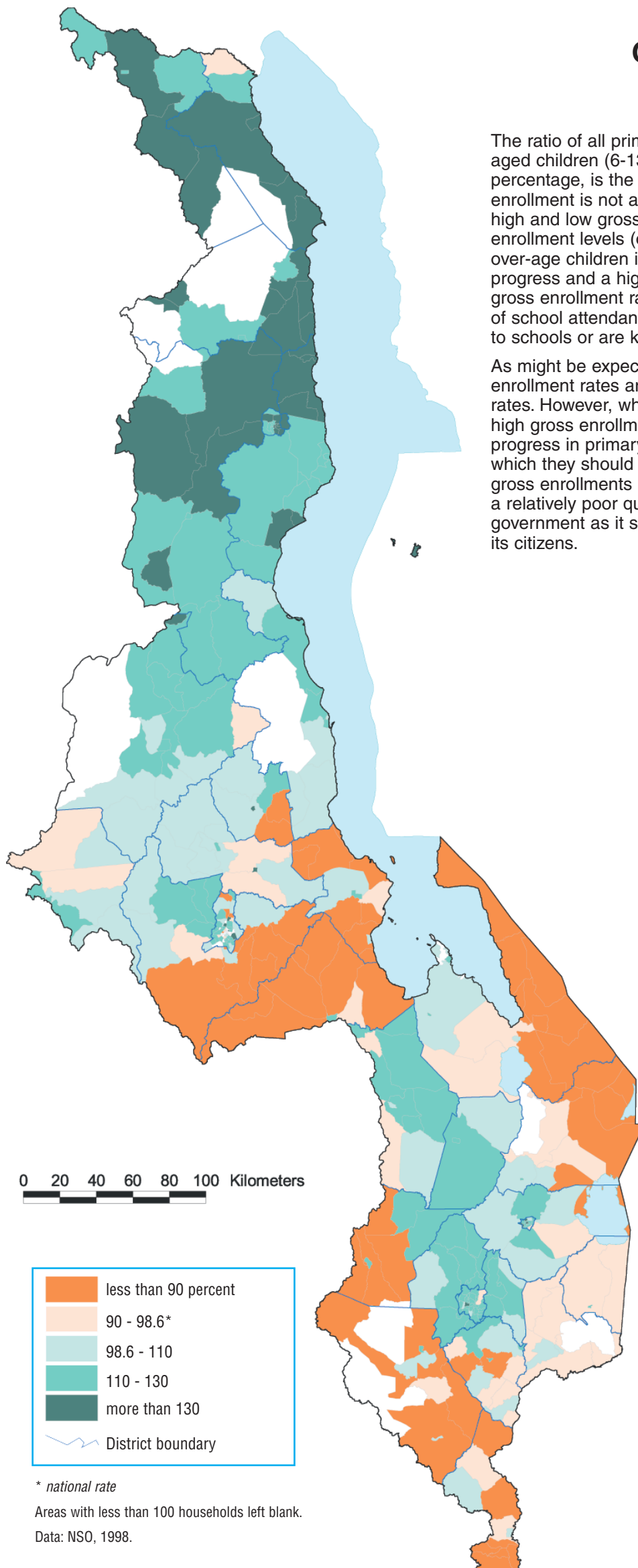
District boundary

Gross enrollment

Malawi 1998

The ratio of all primary school students to all primary school aged children (6-13 year olds) in the population, expressed as a percentage, is the gross enrollment rate. Interpreting gross enrollment is not as easy as interpreting net enrollment. Both high and low gross enrollment rates are undesirable. High gross enrollment levels (over 100 percent) indicate large numbers of over-age children in primary school, indicating poor academic progress and a high level of repetition in the school system. Low gross enrollment rates reflect low net enrollment rates from lack of school attendance either because children have poor access to schools or are kept away by their parents.

As might be expected, areas of the country with the lowest net enrollment rates are also those with the lowest gross enrollment rates. However, where net enrollments are high, one also finds high gross enrollments as students are not making good progress in primary school and remain there beyond the age at which they should have moved on to secondary school. The high gross enrollments rates for Malawi indicate that its schools are of a relatively poor quality, posing a daunting challenge for the government as it seeks to improve the educational attainment of its citizens.

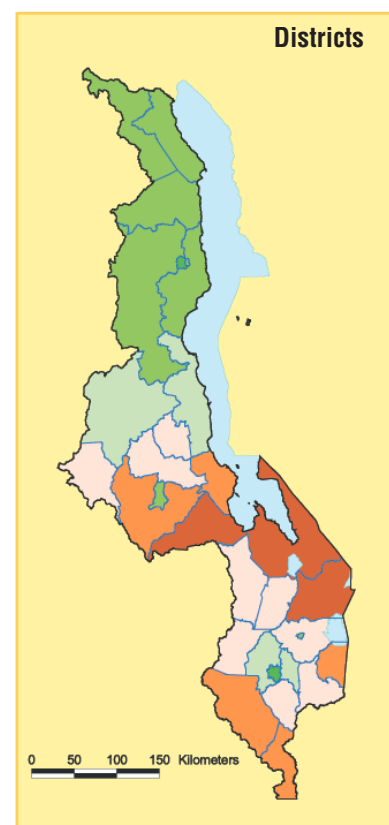
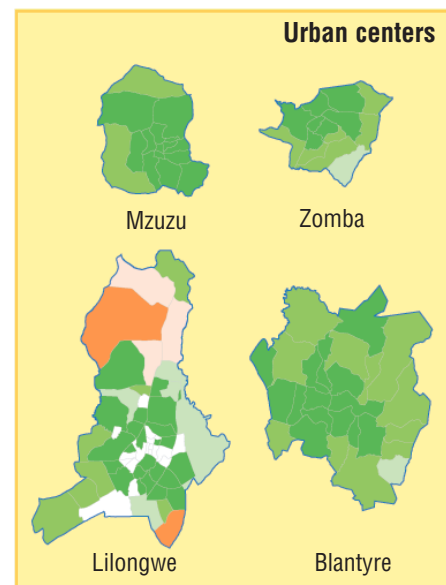
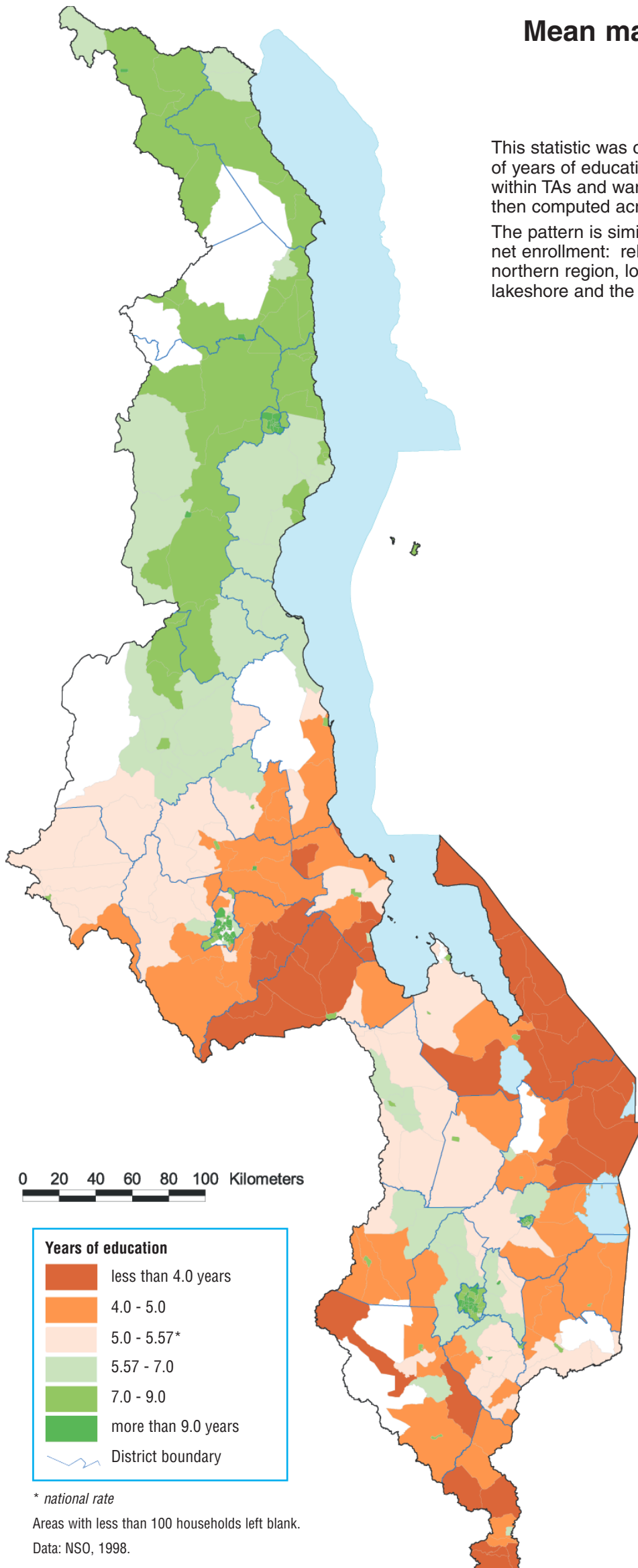


Mean maximum educational level in households

Malawi 1998

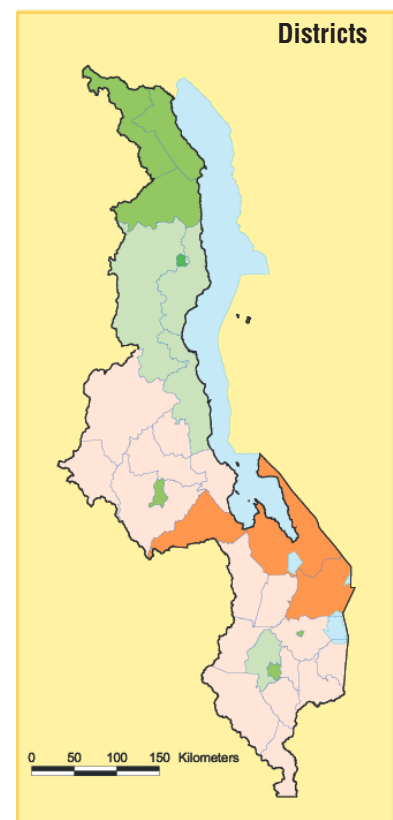
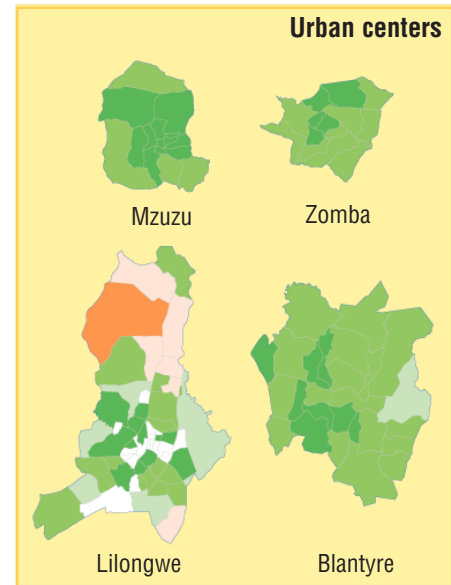
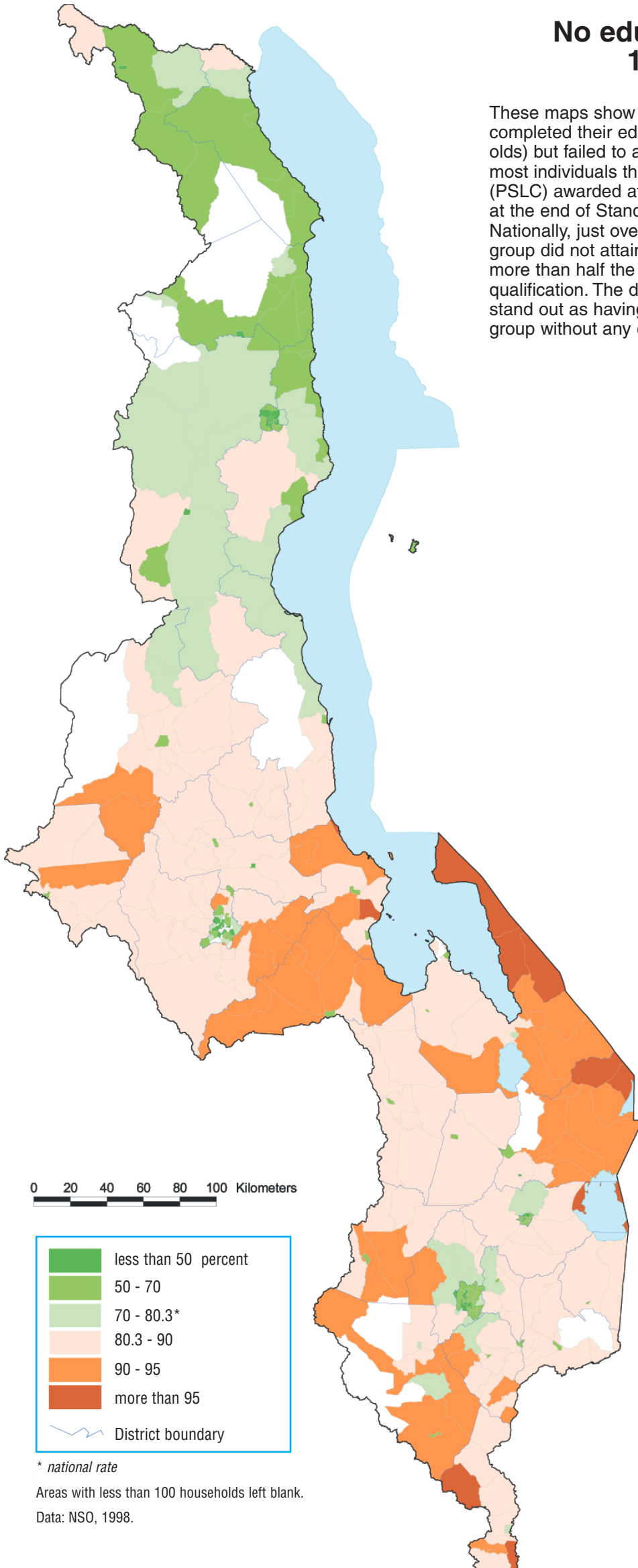
This statistic was computed by determining the highest number of years of education attained by members in each household within TAs and wards. The mean maximum education level was then computed across all households for each area.

The pattern is similar to that shown in other maps on literacy and net enrollment: relatively high levels in the urban areas and the northern region, low levels in the districts of the southern lakeshore and the lower Shire valley.



No educational qualification, 15 to 24 year olds

These maps show the distribution of individuals who should have completed their education according to their age (15-24 year olds) but failed to attain the lowest educational qualification; for most individuals this is the primary school leaving certificate (PSLC) awarded at the successful completion of the examination at the end of Standard 8, the highest primary class level. Nationally, just over 80 percent of the population in this age group did not attain the PSLC. Only in a few urban areas did more than half the population in this age group earn at least this qualification. The districts of Dedza, Mangochi, and Machinga stand out as having particularly high proportions of this age group without any educational qualifications.



* national rate

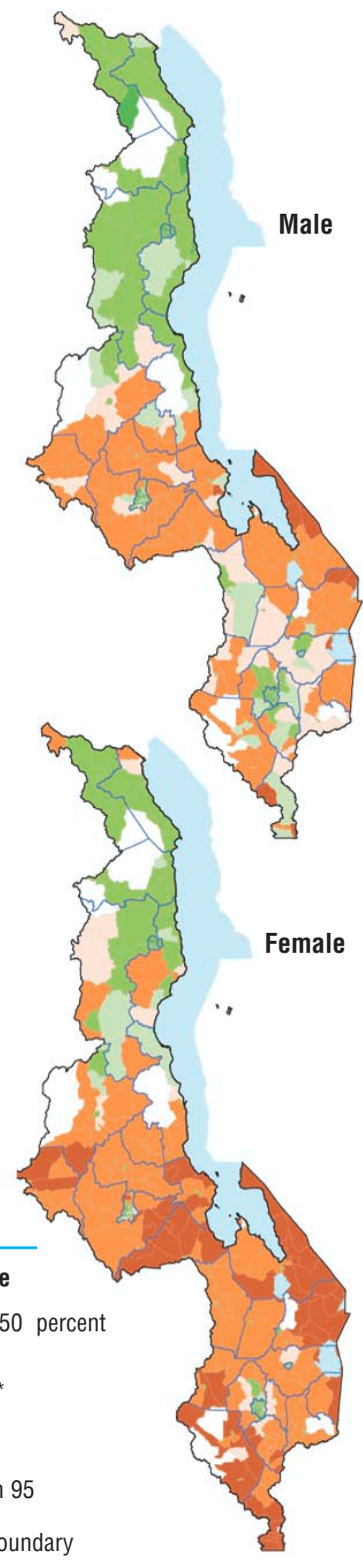
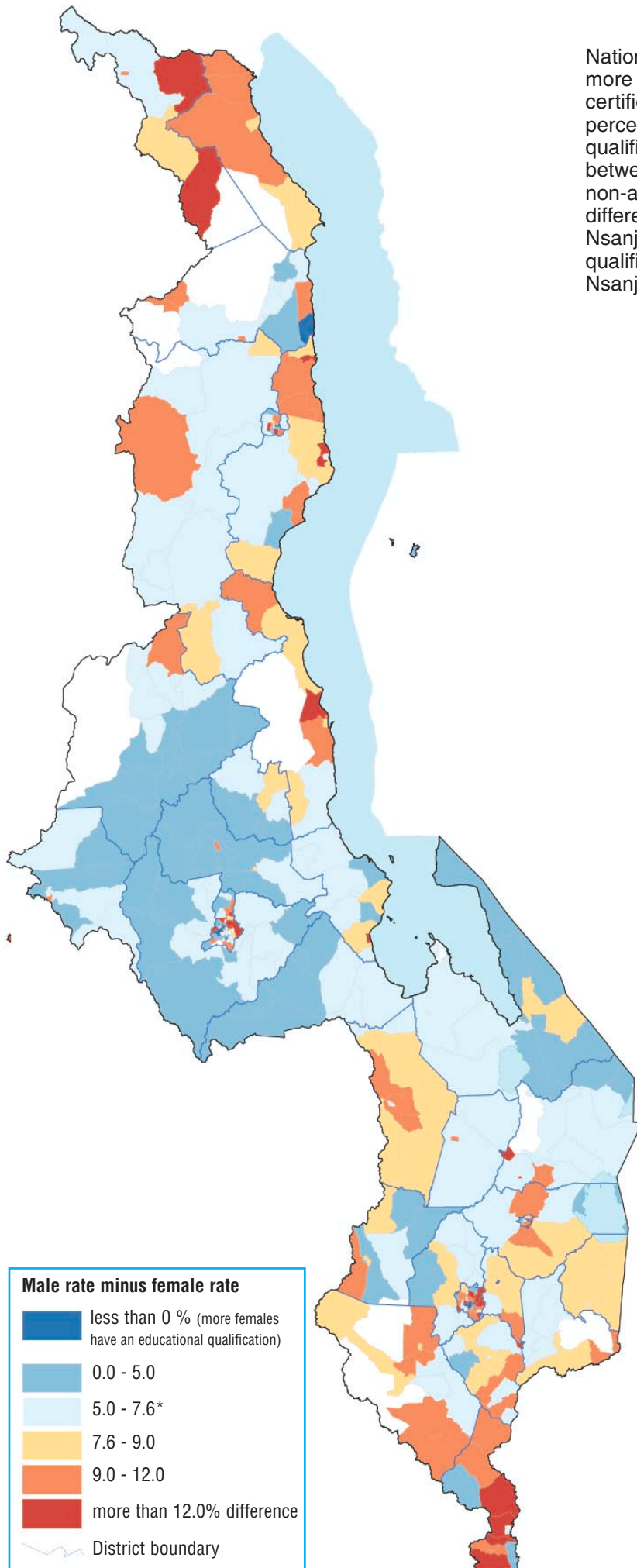
Areas with less than 100 households left blank.

Data: NSO, 1998.

No educational qualification, 15 to 24 year olds, gender differences

Malawi 1998

Nationally, for those individuals aged 15-24 years, 7.6 percent more men than women attained the primary school leaving certificate (PSLC) qualification; 76.3 percent of men and 83.9 percent of women in this age group have no educational qualifications, respectively. The overall pattern of differences between the sexes is unclear, primarily because overall rates of non-attainment of an educational qualification are so high. Large differences between the sexes are seen in both Karonga and in Nsanje districts; however, overall attainment of educational qualifications is considerably higher in Karonga than it is in Nsanje.



* national rate

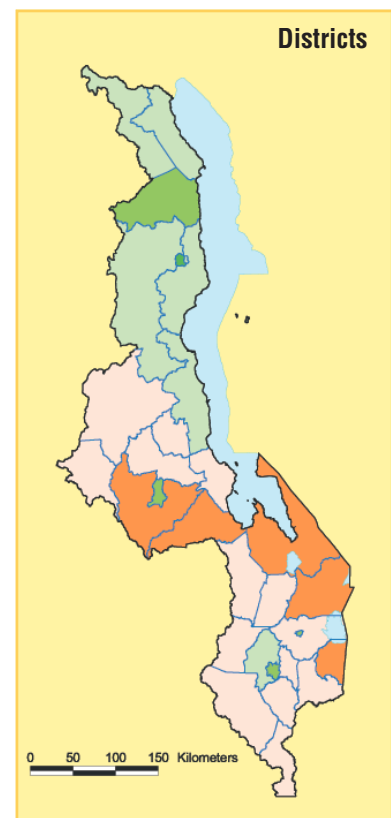
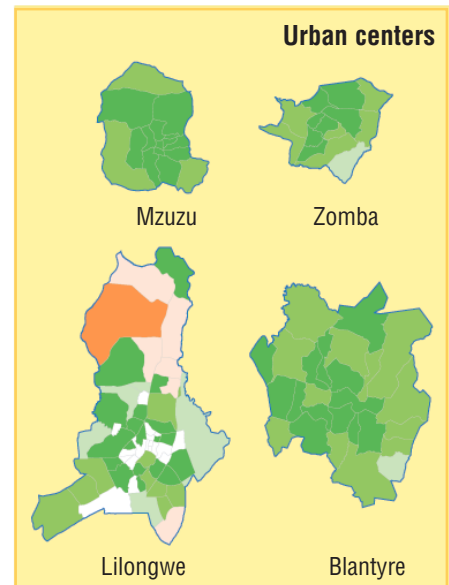
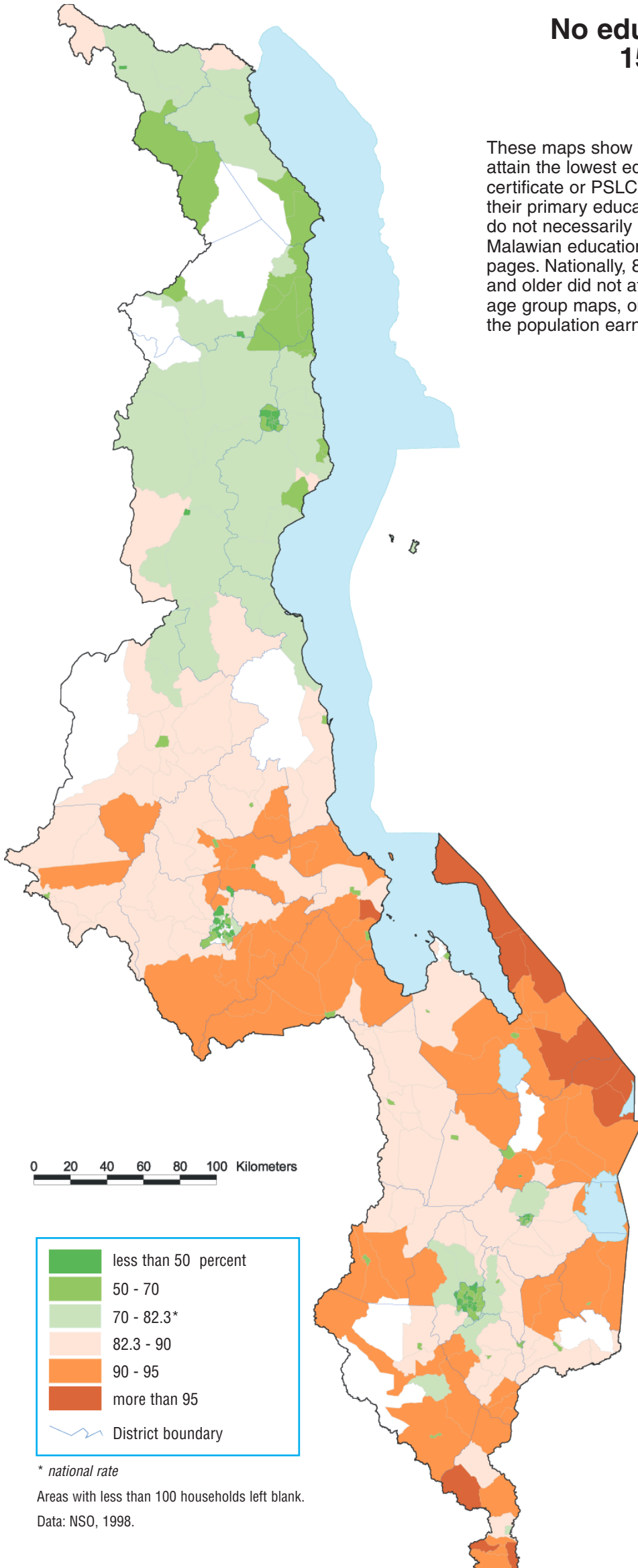
Areas with less than 100 households left blank.

Data: NSO, 1998.

No educational qualification, 15 years and older

Malawi 1998

These maps show the distribution of individuals who did not attain the lowest educational qualification (primary school leaving certificate or PSLC) by the time they should have completed their primary education (15 years and older). Note that the maps do not necessarily reflect the recent performance of the Malawian educational system as do those on the previous two pages. Nationally, 82.3 percent of the population aged 15 years and older did not attain the PSLC. As with the 15-24 year old age group maps, only in a few urban areas did more than half the population earn at least this qualification.



* national rate

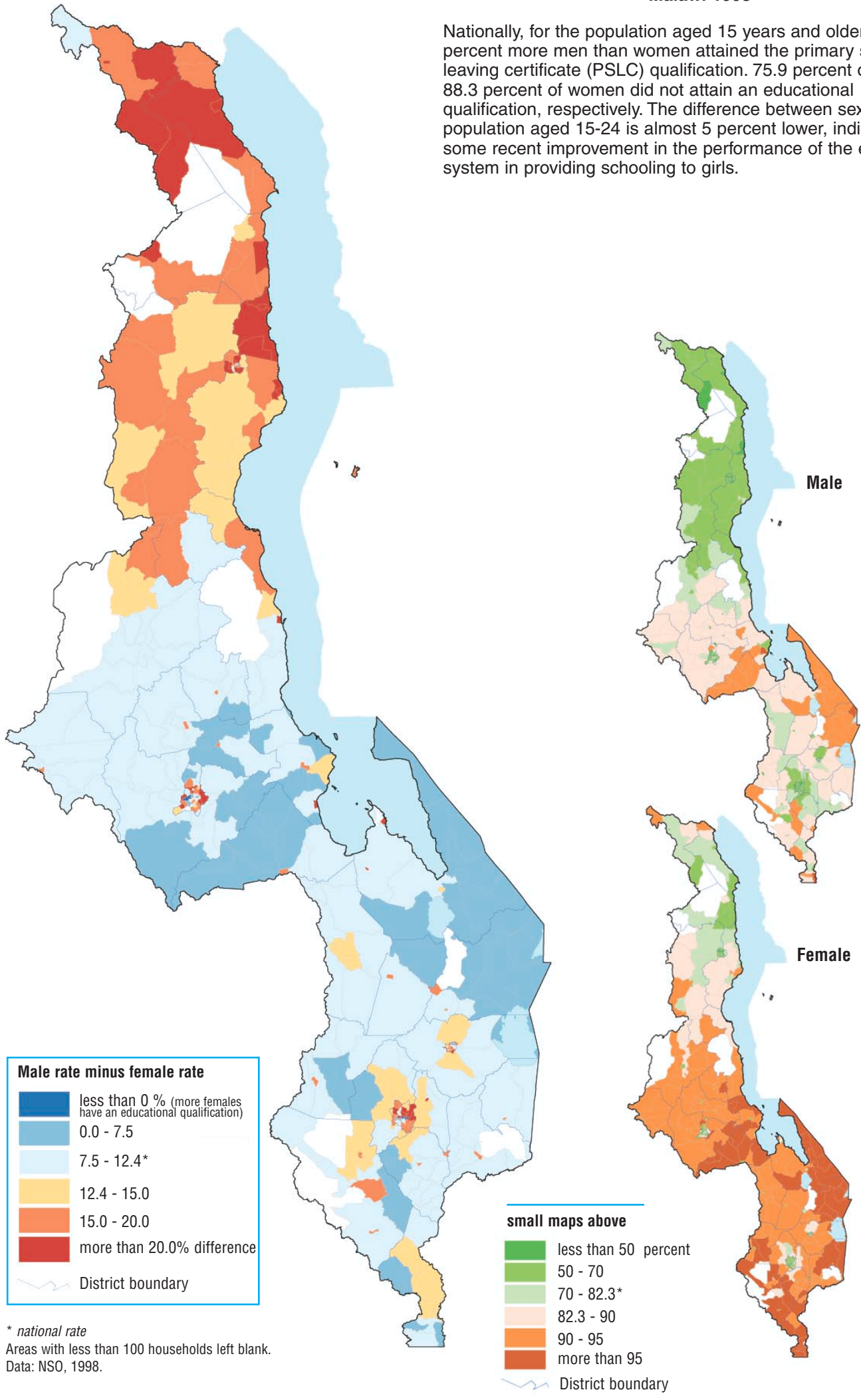
Areas with less than 100 households left blank.

Data: NSO, 1998.

No educational qualifications, 15 years and older, gender differences

Malawi 1998

Nationally, for the population aged 15 years and older, 12.4 percent more men than women attained the primary school leaving certificate (PSLC) qualification. 75.9 percent of men and 88.3 percent of women did not attain an educational qualification, respectively. The difference between sexes for the population aged 15-24 is almost 5 percent lower, indicating some recent improvement in the performance of the educational system in providing schooling to girls.

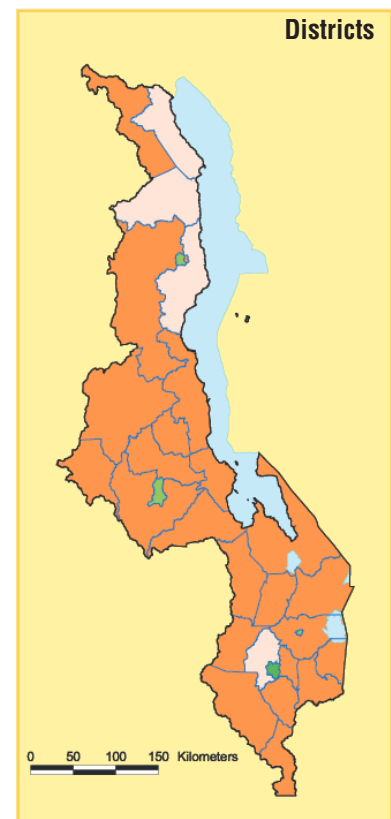
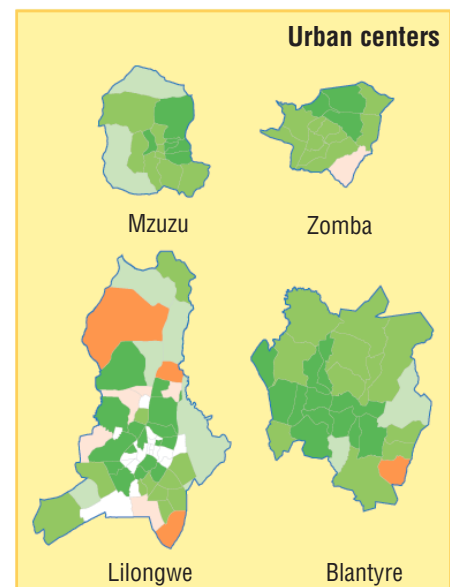
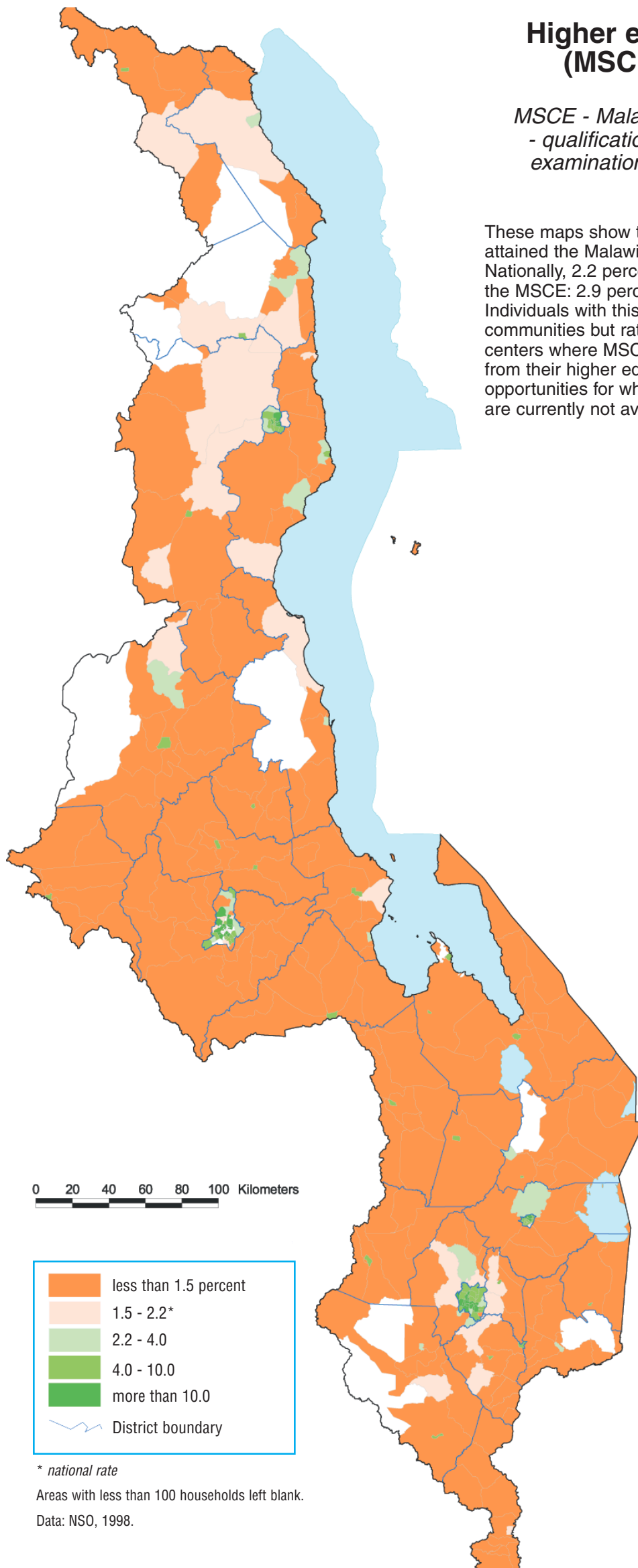


Higher educational qualification (MSCE), 15 to 24 year olds

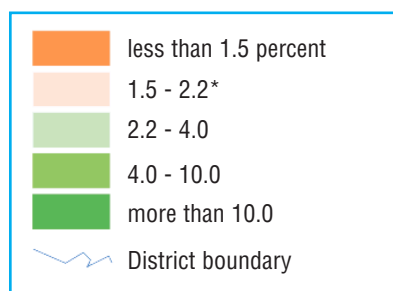
MSCE - Malawi Schools Certificate of Education - qualification earned by successfully passing examinations at the end of secondary school

Malawi 1998

These maps show the distribution of 15-24 year olds who attained the Malawi schools certificate of education (MSCE). Nationally, 2.2 percent of individuals in this age group attained the MSCE: 2.9 percent of males and 1.6 percent of females. Individuals with this level of education do not remain in the rural communities but rather live in the urban centers. It is in the urban centers where MSCE holders can derive an economic return from their higher educational attainment. Such economic opportunities for which higher levels of education are necessary are currently not available in rural Malawi.



0 20 40 60 80 100 Kilometers



* national rate

Areas with less than 100 households left blank.

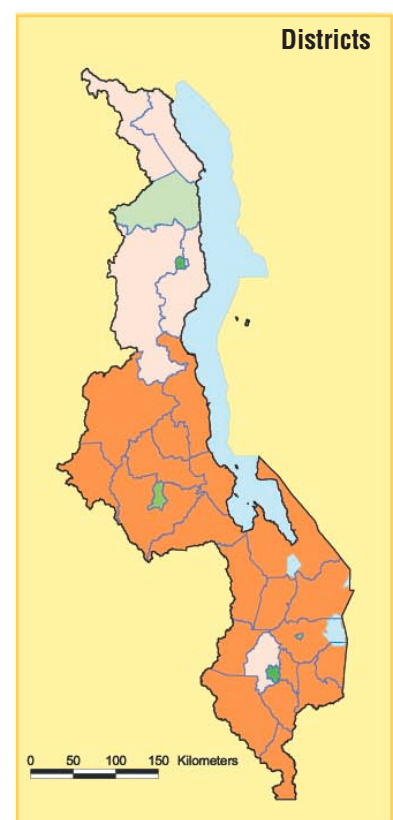
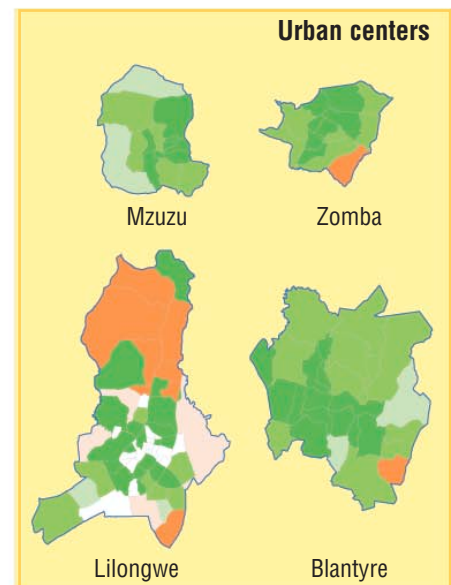
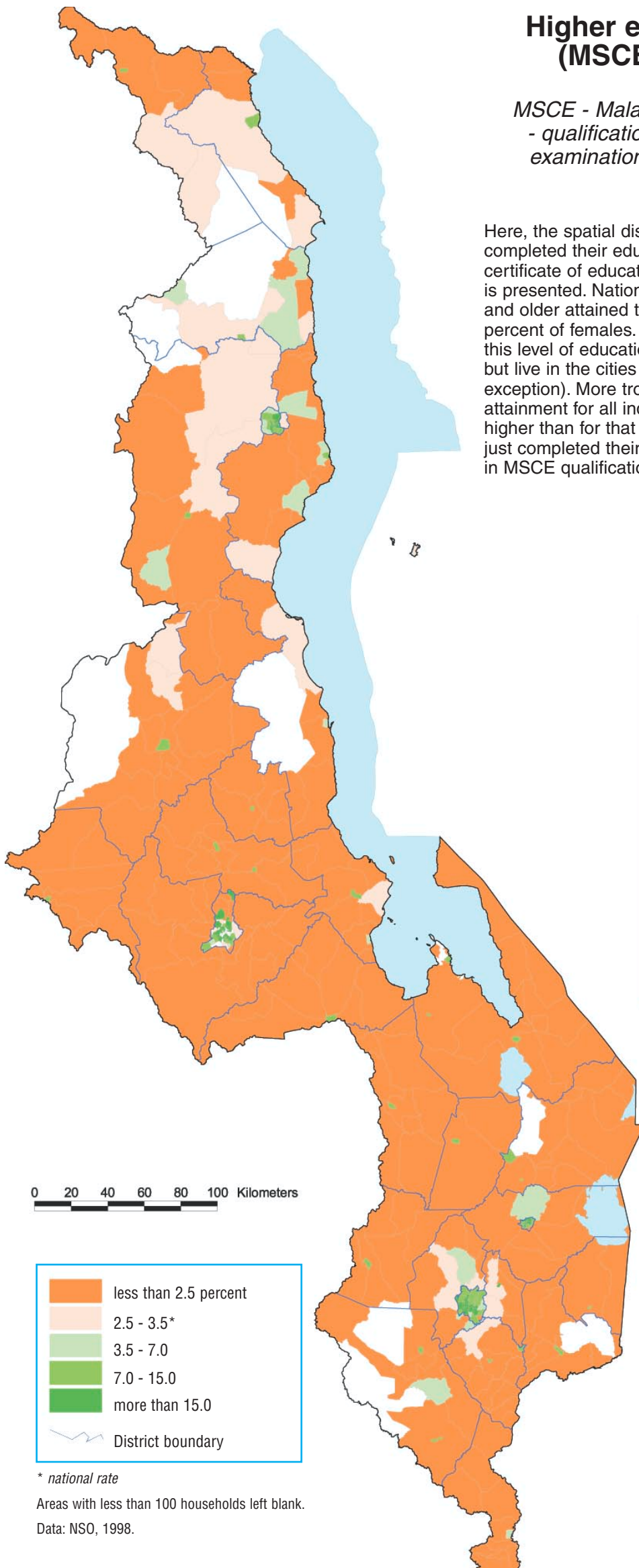
Data: NSO, 1998.

Higher educational qualification (MSCE), 15 years and older

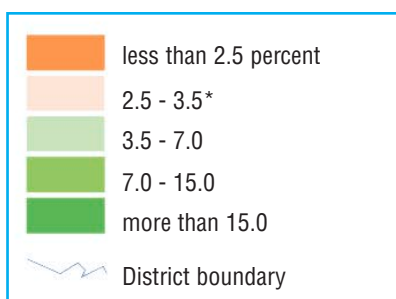
MSCE - Malawi Schools Certificate of Education - qualification earned by successfully passing examinations at the end of secondary school

Malawi 1998

Here, the spatial distribution of individuals who should have completed their education and who attained the Malawi schools certificate of education (MSCE) at the end of secondary school is presented. Nationally, 3.5 percent of individuals aged 15 years and older attained the MSCE= 5.3 percent of males and 1.7 percent of females. As with the previous map, individuals with this level of education do not remain in the rural communities, but live in the cities (although Rumphii district is a slight exception). More troubling, however, is that the level of MSCE attainment for all individuals 15 years and older, 3.5 percent, is higher than for that of individuals aged 15 to 24 years who have just completed their schooling, 2.2 percent, indicating a decline in MSCE qualification rates in recent years.



0 20 40 60 80 100 Kilometers



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

Educational facilities

Malawi - 2001

Primary schools

These maps show the location of the majority of primary and secondary schools in Malawi. This information was collected by the Ministry of Education in 2001 on about 4,700 primary schools (junior, senior, and junior and senior combined) and just under 700 secondary schools.


Unfortunately, no information was collected on schools in the Chiradzulu district. Moreover, for about 10 percent of all schools, the information collected was incomplete, so these schools could not be mapped.



Secondary schools



Each dot represents one school

 Chiradzulu district - no data

 District boundary

Data: Ministry of Education, 2001.

Ratios of primary school pupils to teachers and primary-aged children to teachers

Malawi

Primary school pupils per teacher

These two maps provide an indication of the level of provision of instruction to primary school students and to the potential primary school population for each TA. These statistics were computed by coupling the 2001 educational facilities inventory data of the Ministry of Education with the 1998 census data.

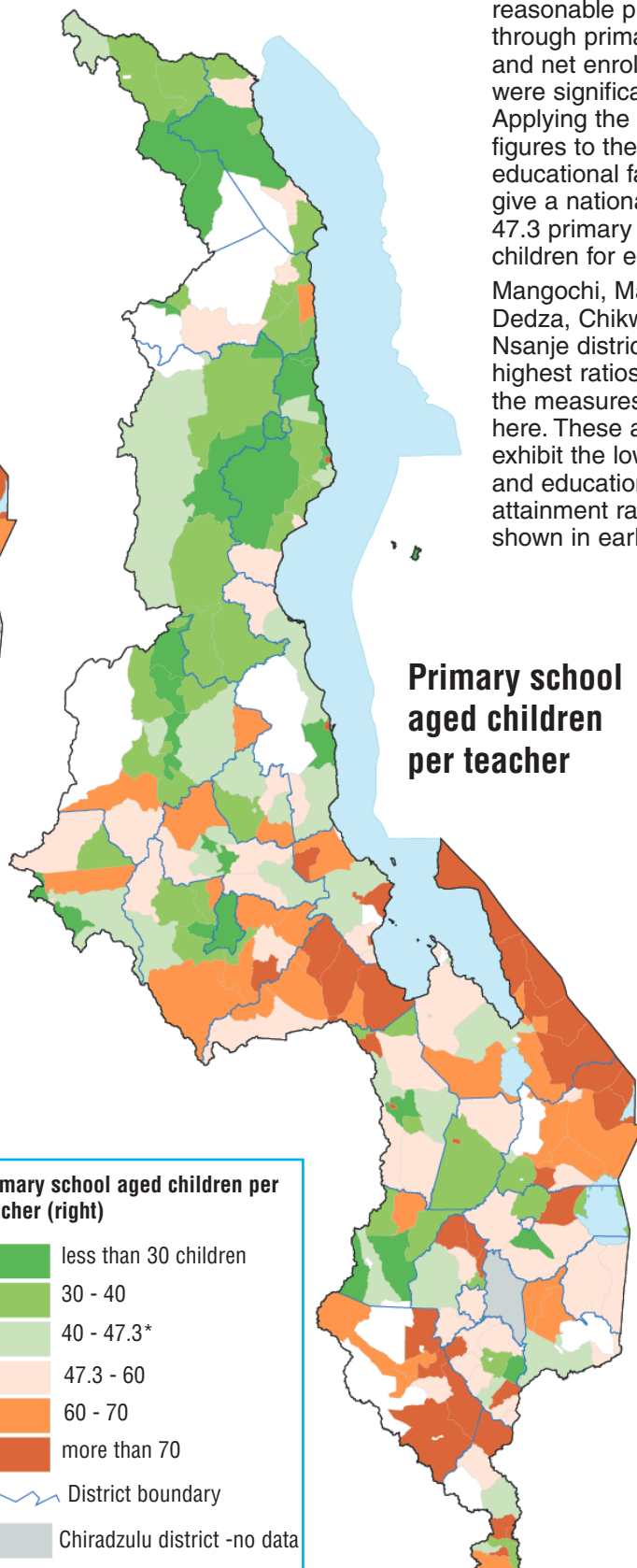
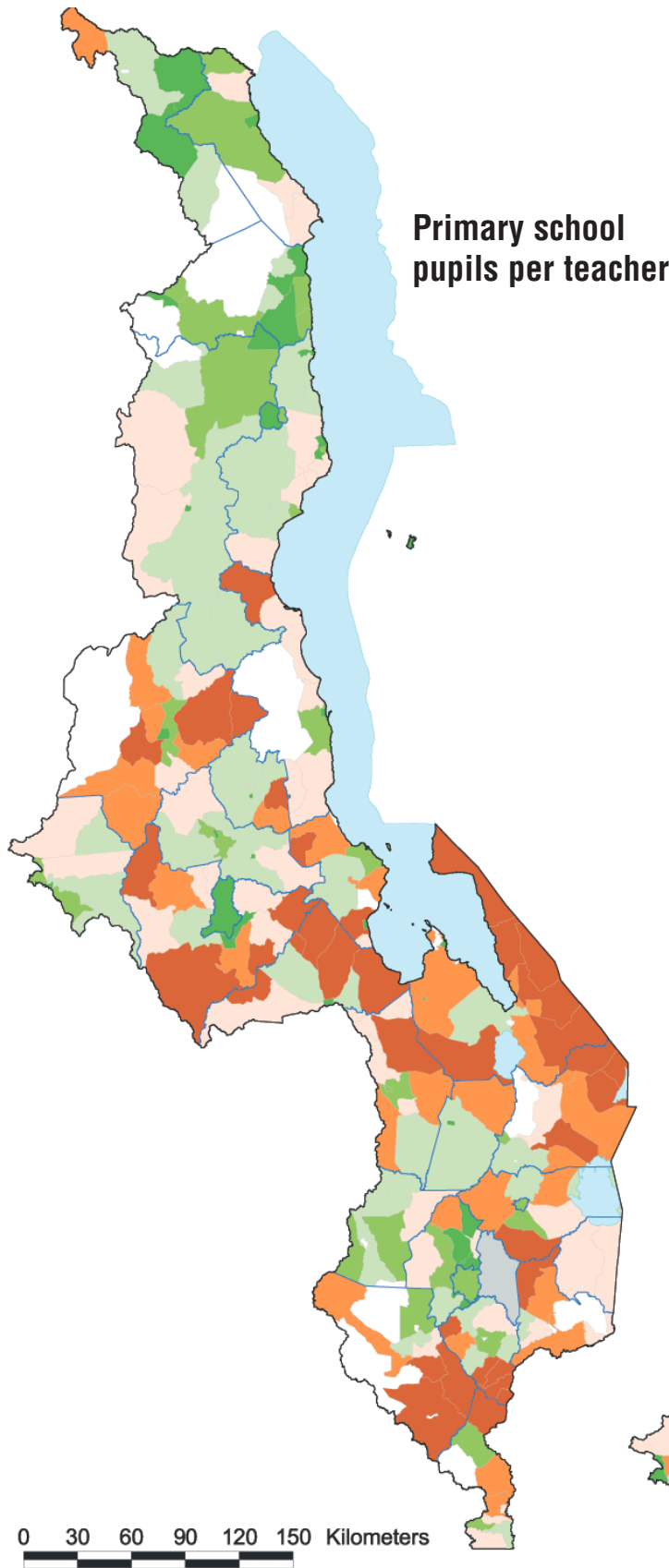
The primary school pupils per teacher ratio indicates the number of children each teacher must instruct. The national rate is 69.8 pupils per teacher. This very high level is due to the introduction of universal free primary education in the mid-1990s resulting in an influx of students into the primary school system which had insufficient teachers to instruct them.

The ratio of teachers to the number of children of primary school age (6 to 13) shows the potential demand for teachers if

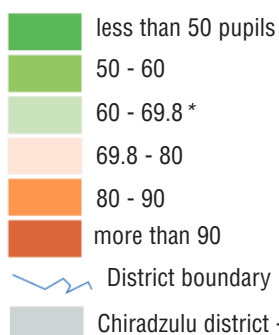
students were to make reasonable progress through primary school and net enrollment rates were significantly higher. Applying the 1998 census figures to the 2001 educational facilities data give a national statistics of 47.3 primary school aged children for each teacher.

Mangochi, Machinga, Dedza, Chikwawa, and Nsanje district have the highest ratios for both of the measures mapped here. These areas also exhibit the lowest literacy and educational attainment rates, as shown in earlier maps.

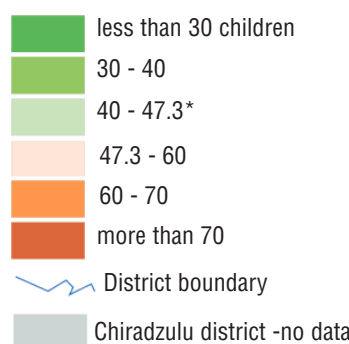
Primary school aged children per teacher



Primary school pupils per teacher (above)



Primary school aged children per teacher (right)



* national rate

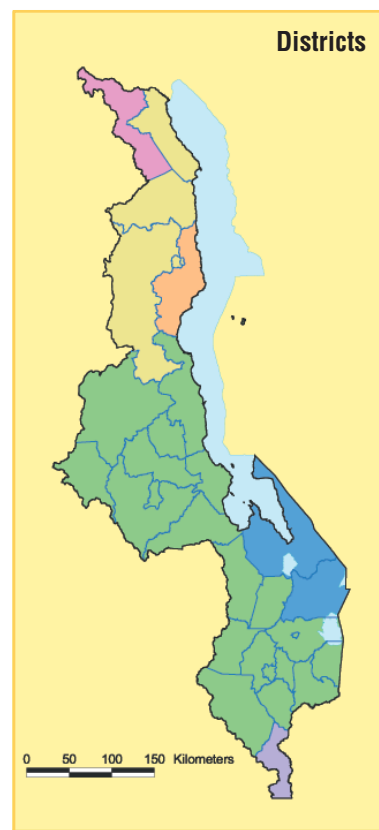
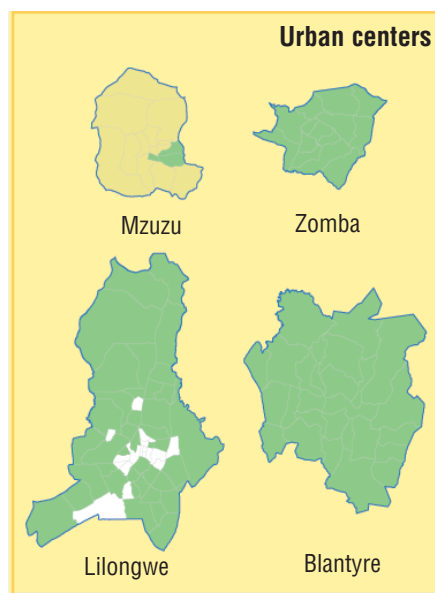
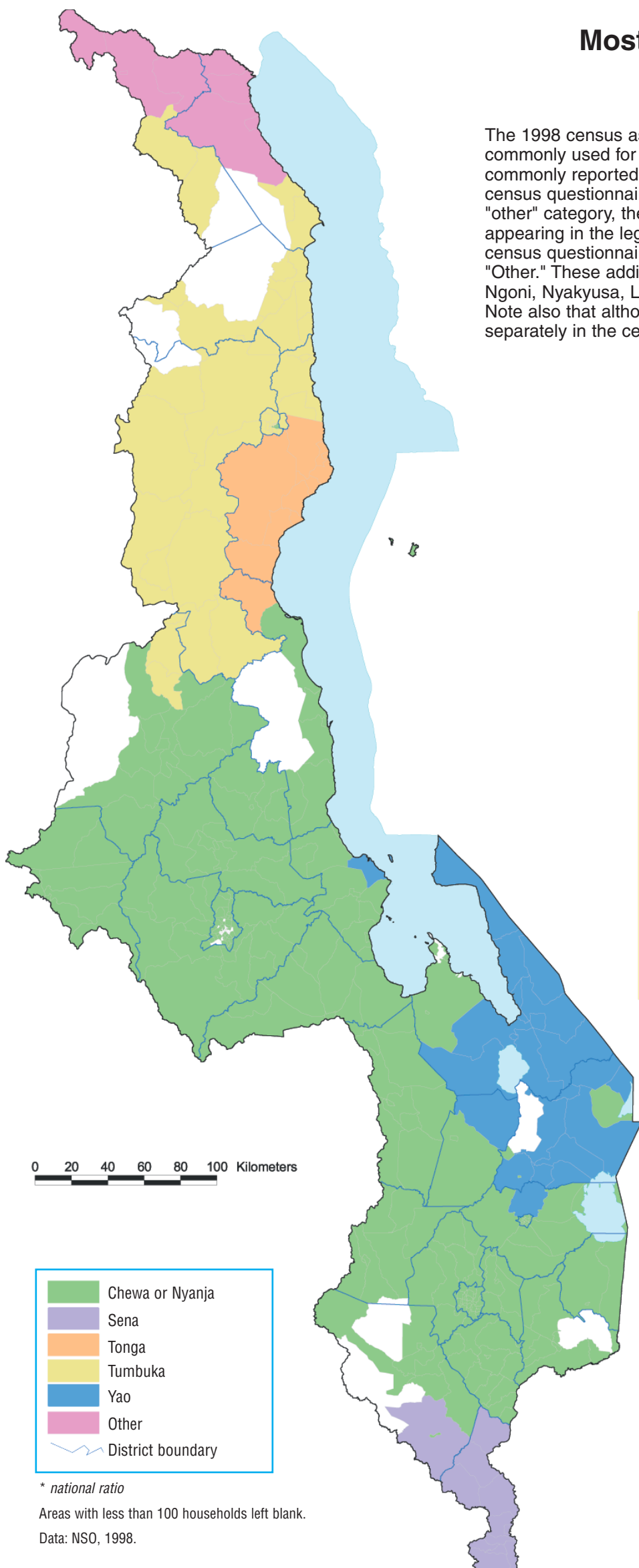
Areas with less than 100 households left blank.

Data: NSO, 1998.

Most common language

Malawi 1998

The 1998 census asked all households what language they most commonly used for communication. These maps show the most commonly reported languages for each area. Note that while the census questionnaire included 14 language categories and an "other" category, these maps focus on the six languages appearing in the legend below. Additional languages from the census questionnaire, when reported, are included under "Other." These additional languages are Lomwe, Nkhonde, Ngoni, Nyakyusa, Lambya, Senga, English, and Portuguese. Note also that although Chewa and Nyanja were reported separately in the census, they are combined in these maps.



- Chewa or Nyanja
- Sena
- Tonga
- Tumbuka
- Yao
- Other
- District boundary

* national ratio

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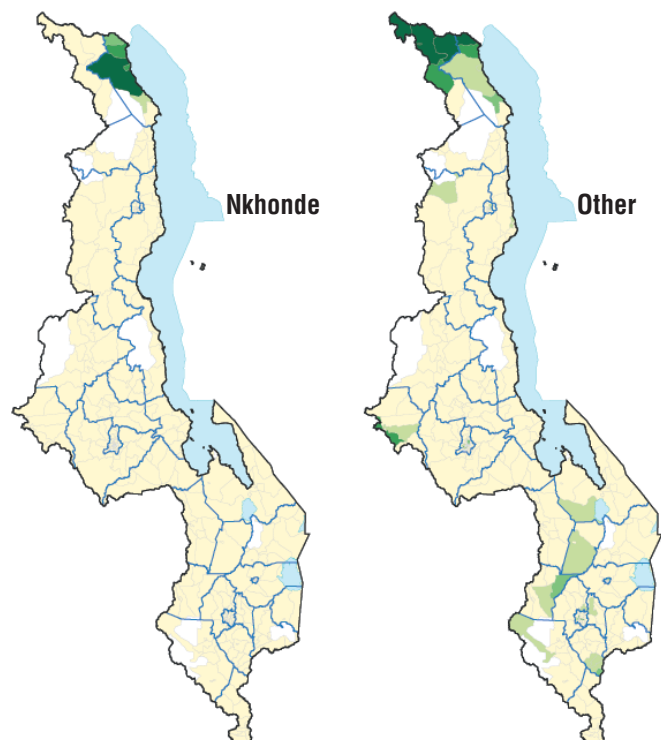
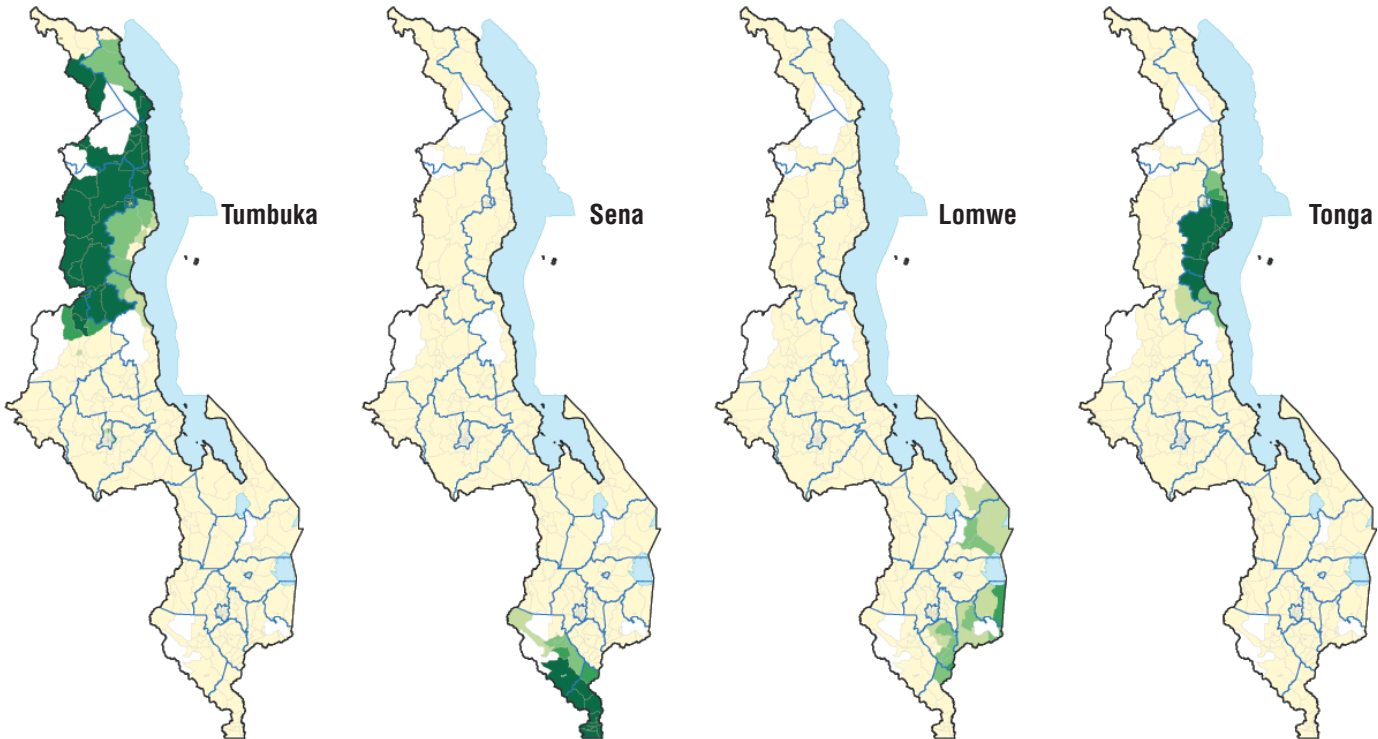
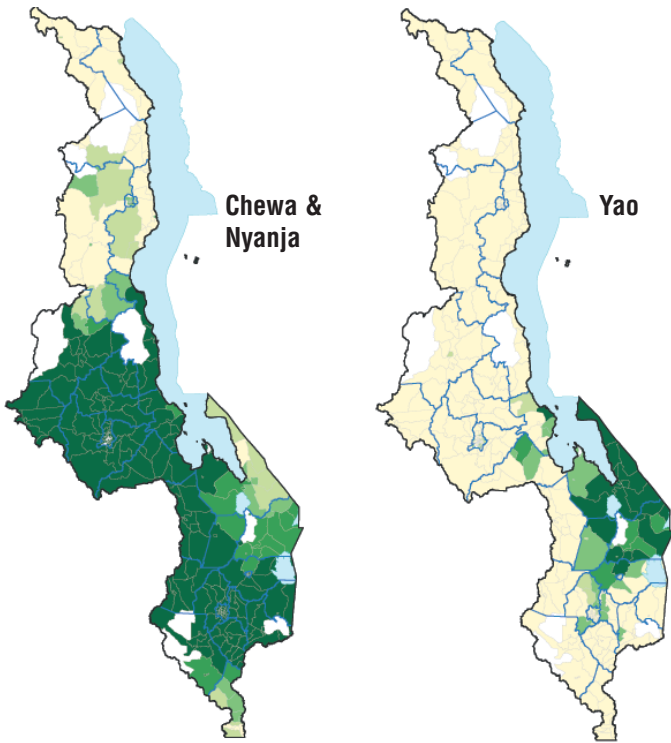
Data: NSO, 1998.

Proportion of population speaking a language

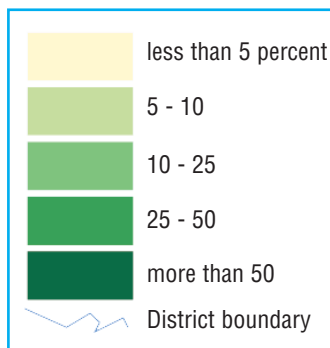
Malawi 1998

These maps show the proportion of the population using a given language for communication within the household. While the census questionnaire included 14 language categories plus an "other" category, only eight of these 14 languages are mapped here. The remaining six languages (Ngoni, Senga, Nyakyusa, Lambya, English, and Portuguese), when reported, are included in the "Other" map. Note also that although Chewa and Nyanja were reported separately in the census, they are combined in these maps. The national breakdown of the proportion of the population using the various languages for communication in the household is shown below.

Chewa & Nyanja:	69.9	Sena:	2.7
Chewa:	57.4	Tonga:	1.7
Nyanja:	12.4	Lomwe:	2.4
Yao:	10.1	Nkhonde:	0.8
Tumbuka:	9.5	Other:	2.9



0 60 120 180 240 300 Kilometers

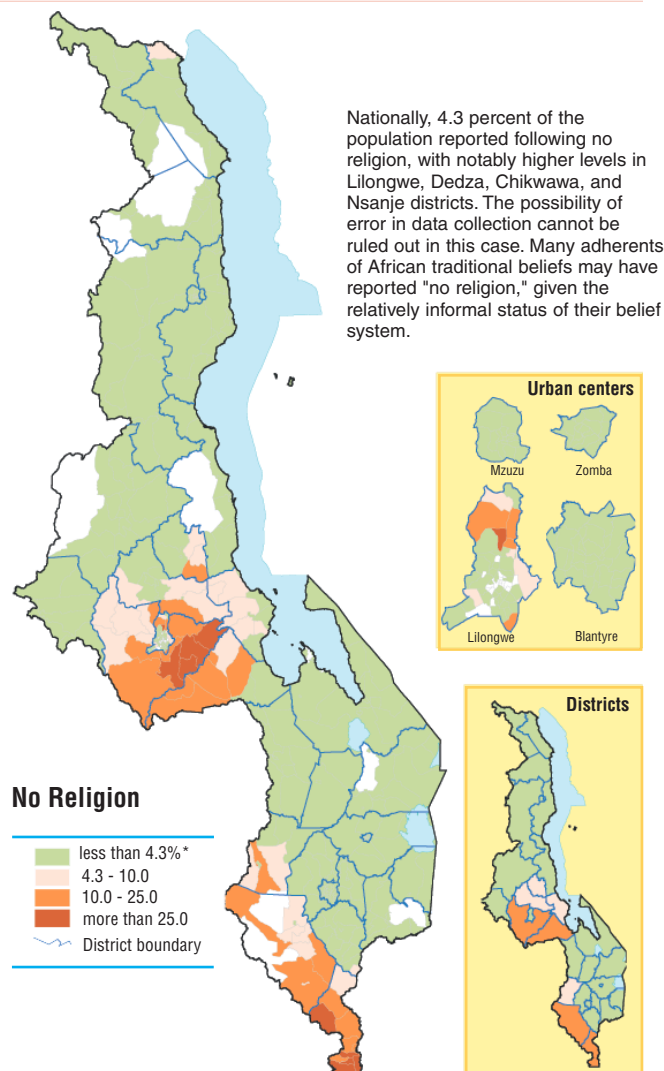
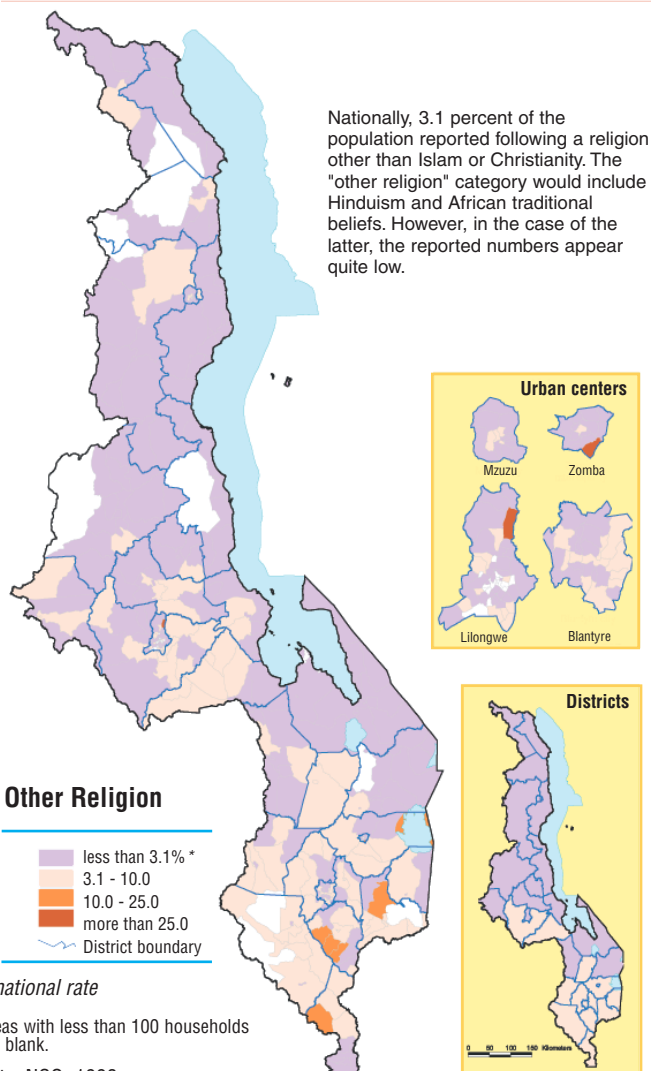
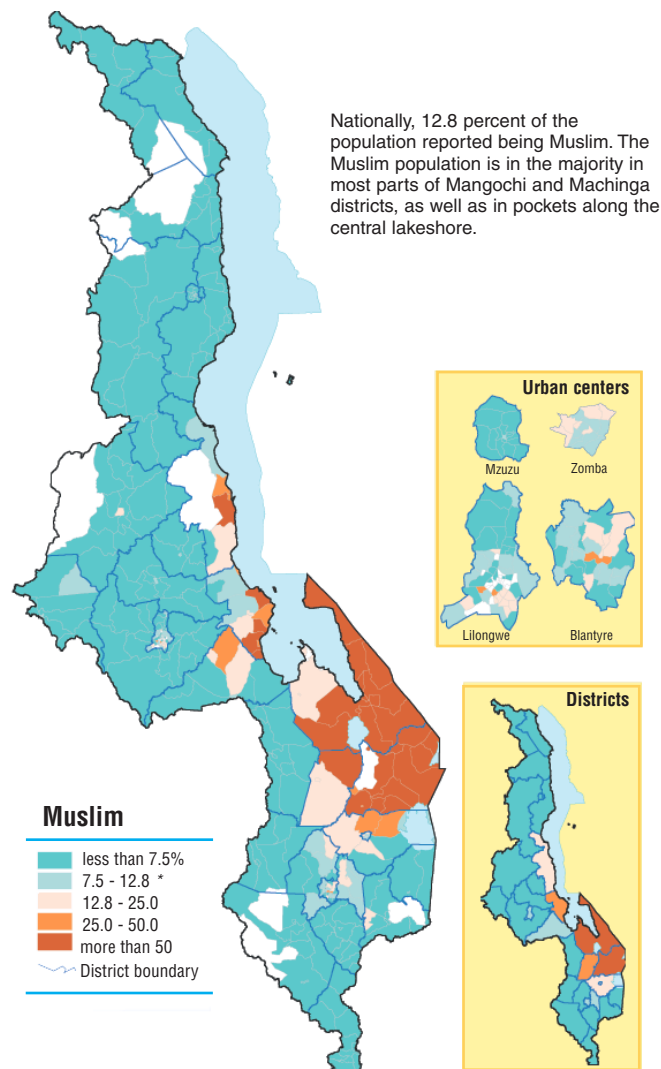
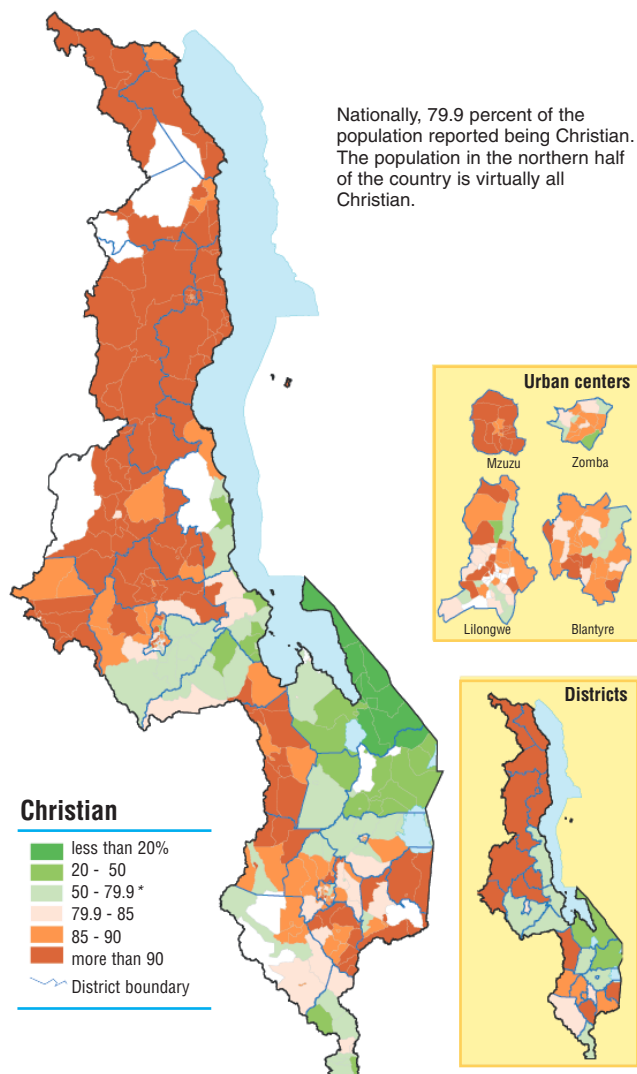


Areas with less than 100 households left blank.

Data: NSO, 1998.

Religion

Percentage of population reporting to be a member of a particular religion
Malawi 1998



* national rate

Areas with less than 100 households left blank.

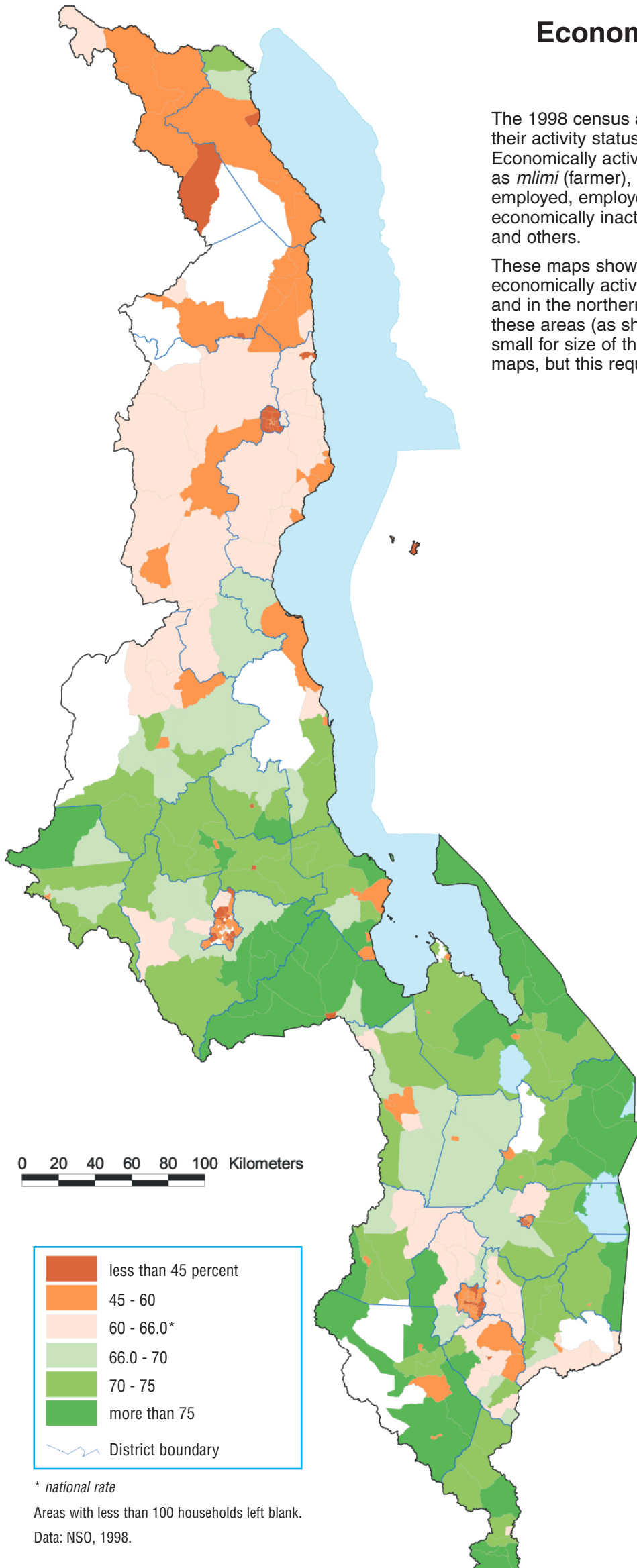
Data: NSO, 1998.

Economically active population

Malawi 1998

The 1998 census asked all individuals 10 years and older what their activity status was over the previous seven days. Economically active individuals are defined as those categorized as *mlimi* (farmer), employee, family-business worker, self-employed, employer, or unemployed. Those classified as economically inactive are non-workers, homeworkers, students, and others.

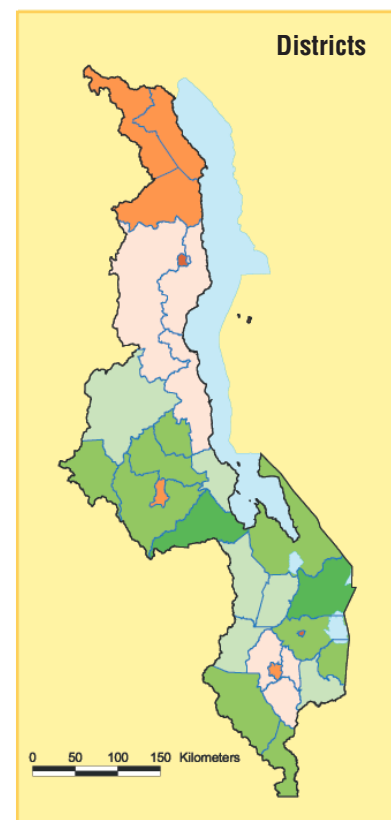
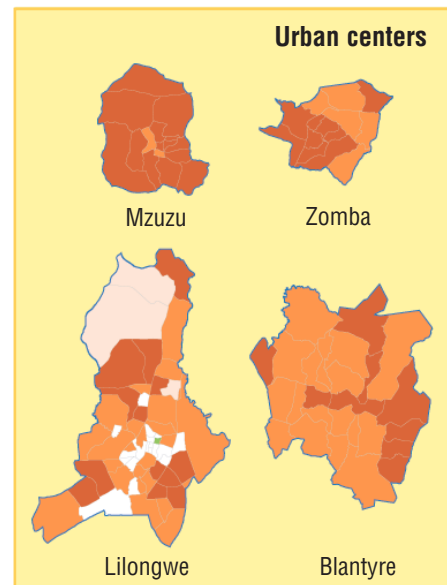
These maps show the proportion of the population considered economically active. Lower levels are found in the urban areas and in the northern region. The higher proportion of students in these areas (as shown in other maps) may result in the relatively small for size of the economically active population in these maps, but this requires further investigation.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

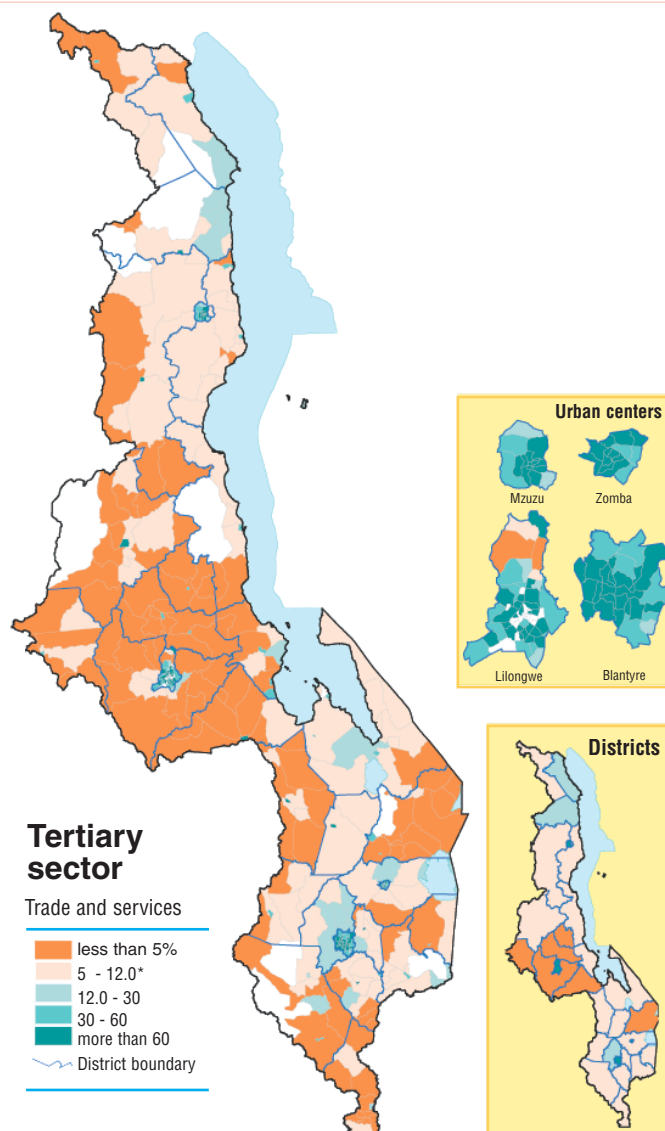
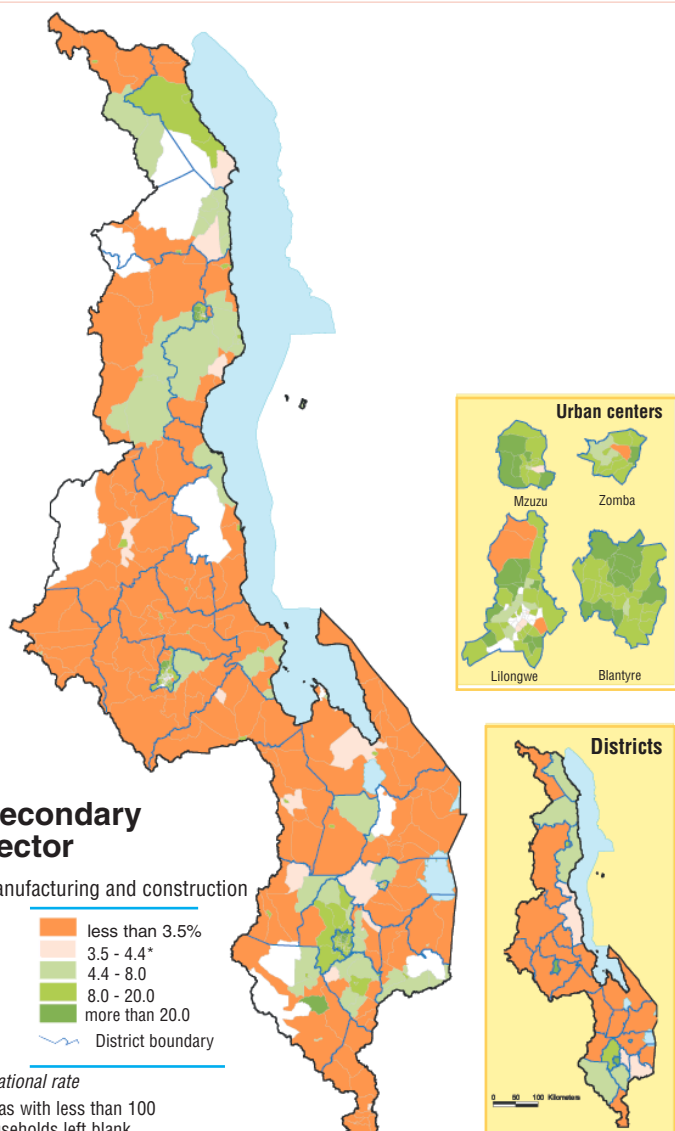
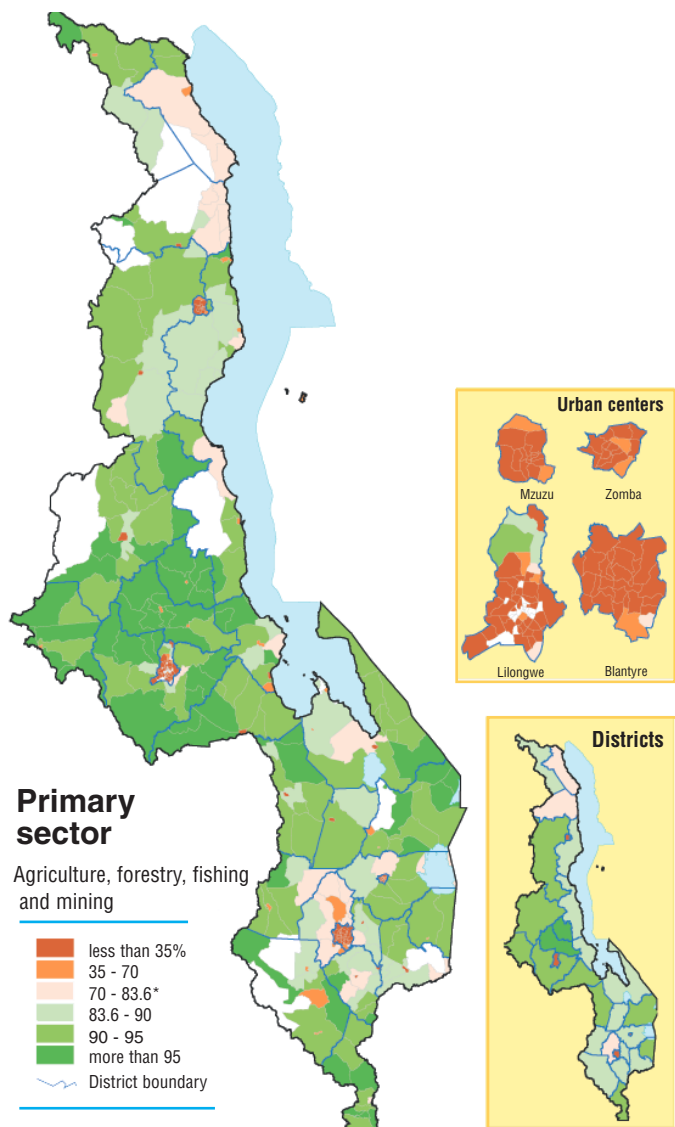


Economic sector of occupation of the economically active

Malawi 1998

The 1998 census asked all individuals 10 years and older who reported being economically active over the previous seven days to specify their occupation - teacher, nurse, driver, farmer, and so on - as well as the industry of their occupation. Here the industry reported is further simplified into three broad sectors, and the proportion of the economically active population working in each is mapped.

The primary economic sector involves the extraction of raw materials from the environment through agriculture, forestry, fishing, and mining; the secondary sector involves processing raw materials and manufacturing; and the tertiary sector involves wholesale and retail trade and the provision of services. As is common with most developing countries, over 80 percent of all workers in Malawi work in the primary sector, most in agriculture. The only areas without a predominance of economic activity in the primary sector are the urban centers and some of the administrative and trading centers in the rural districts. In Malawi the secondary and tertiary sectors are small, involving only 4.4 and 12.0 percent of the economically active population, respectively, concentrated in the four urban centers.



* national rate

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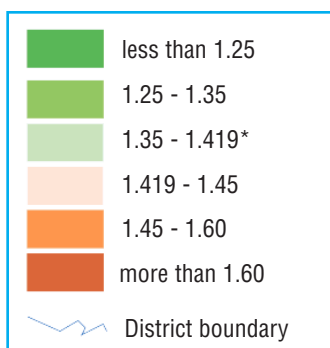
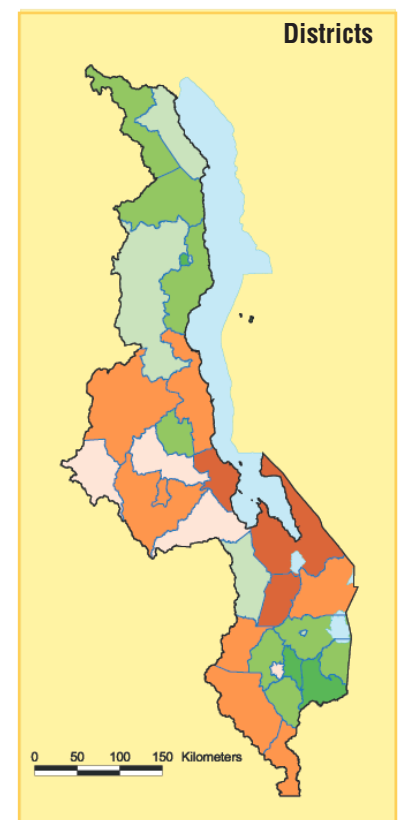
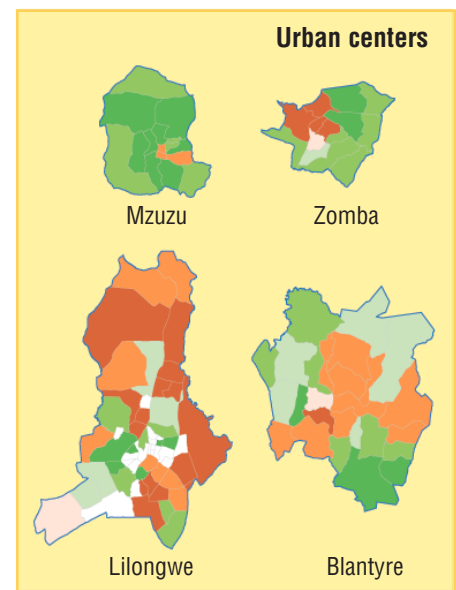
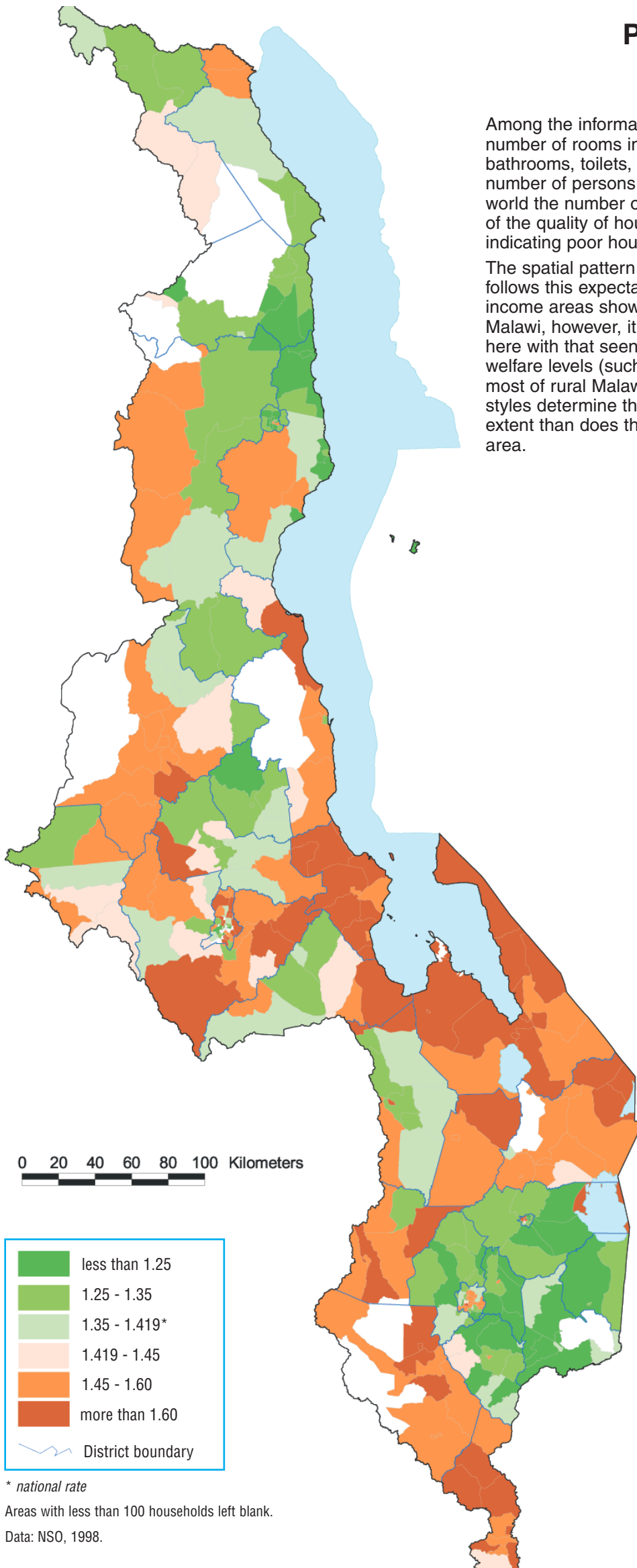
Data: NSO, 1998.

Persons per room

Malawi 1998

Among the information collected in the 1998 census was the number of rooms in each household dwelling (excluding bathrooms, toilets, storerooms, and garages). Here the average number of persons per room is mapped. In many parts of the world the number of persons per room is an important indicator of the quality of housing and general welfare, with overcrowding indicating poor housing and generally low welfare.

The spatial pattern seen in the four urban centers of Malawi follows this expectation, with several of the high density, lower income areas showing high person-per-room values. In rural Malawi, however, it is difficult to correlate the spatial pattern seen here with that seen for other variables strongly associated with welfare levels (such as the poverty maps presented earlier). In most of rural Malawi, it is quite likely that traditional housing styles determine the number of persons per room to a far greater extent than does the general level of household welfare in an area.



* national rate

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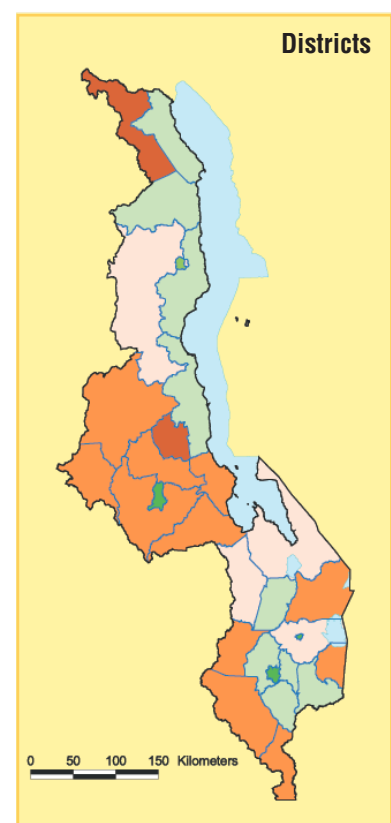
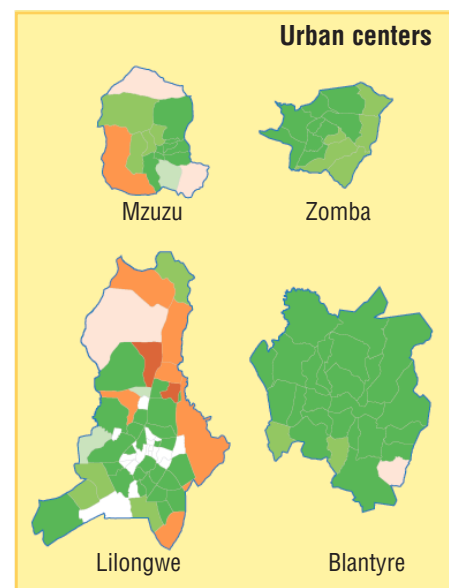
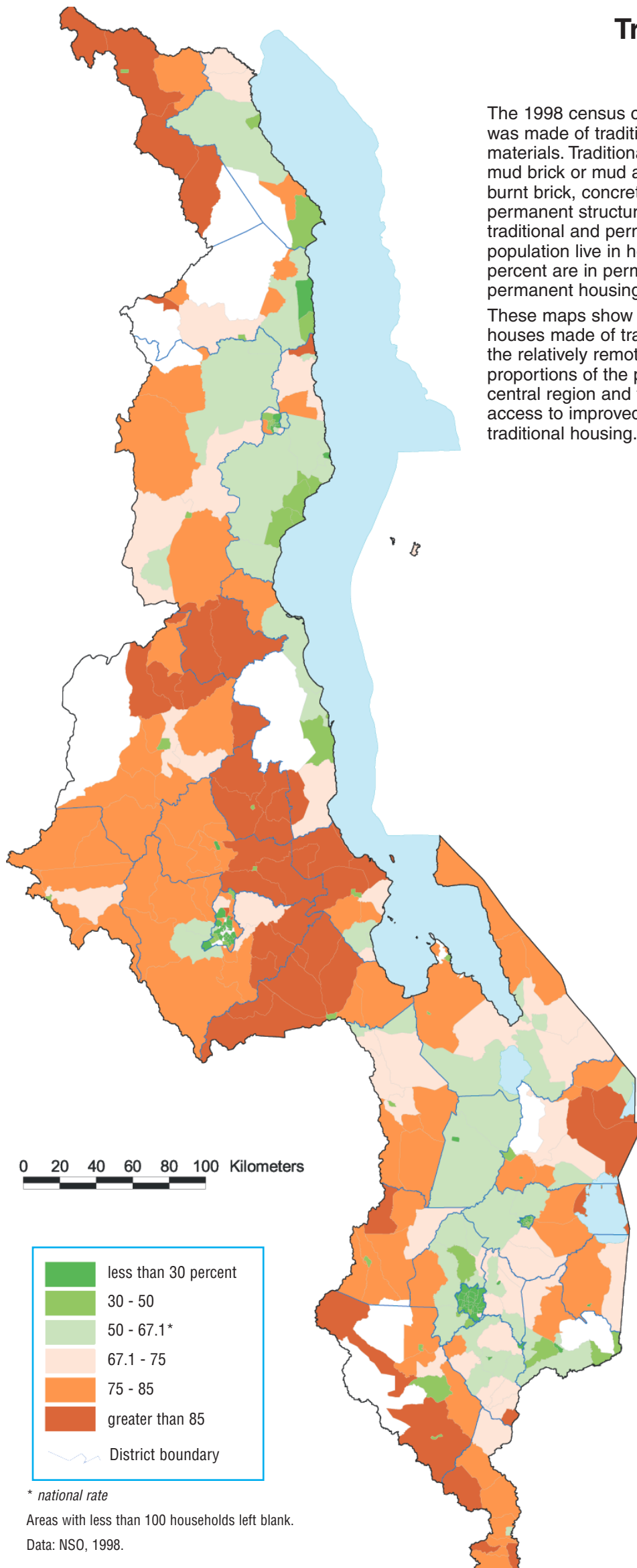
Data: NSO, 1998.

Traditional housing

Malawi 1998

The 1998 census collected information on whether a dwelling was made of traditional, semi-permanent, or permanent materials. Traditional materials include grass thatched roofs and mud brick or mud and wattle walls; permanent materials include burnt brick, concrete, iron roofing sheets, and roofing tiles; semi-permanent structures are those made with a combination of traditional and permanent materials. Just over two-thirds of the population live in housing made of traditional materials, 15.0 percent are in permanent housing, and 17.9 percent live in semi-permanent housing.

These maps show the proportion of the population living in houses made of traditional materials. Highest levels are found in the relatively remote Chitipa and Ntchisi districts; however, large proportions of the population in most of the districts of the central region and the lower Shire valley - areas with reasonable access to improved commercial building materials - also live in traditional housing.



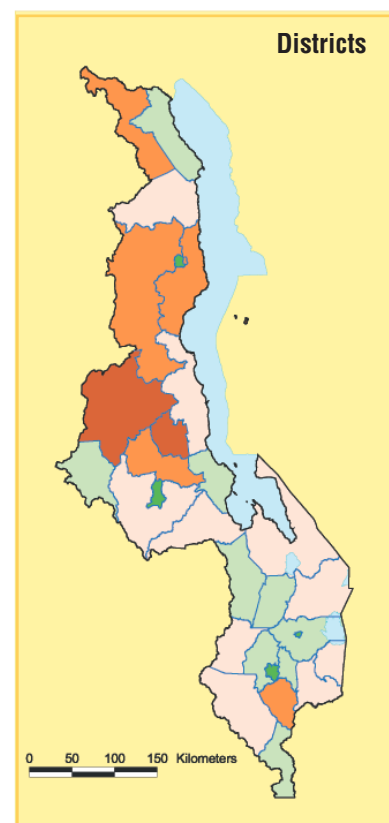
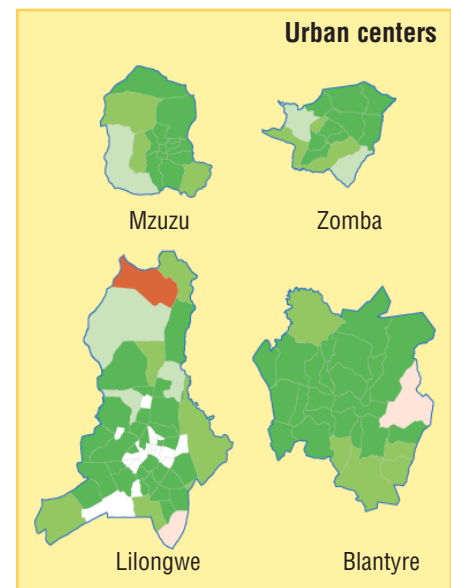
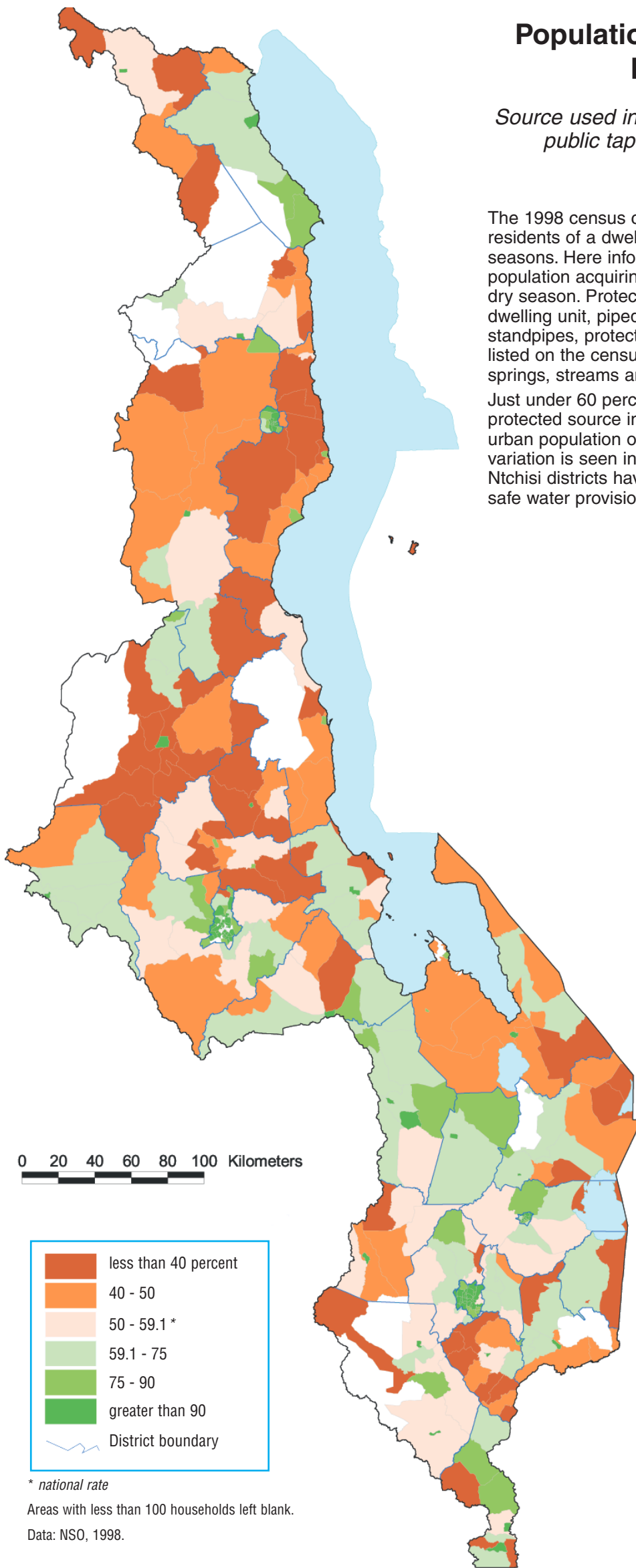
Population acquiring water from a protected source

Source used in the dry season - includes private and public taps, protected wells, and boreholes

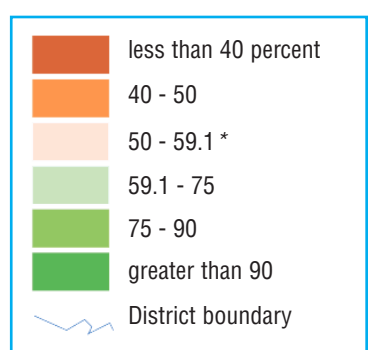
Malawi 1998

The 1998 census collected information on the water source residents of a dwelling unit used in both the dry and rainy seasons. Here information is presented on the proportion of the population acquiring water from a protected water source in the dry season. Protected sources include water piped into the dwelling unit, piped outside the dwelling unit, communal standpipes, protected wells, and boreholes. Unprotected sources listed on the census questionnaire include unprotected wells, springs, streams and rivers, lakes and dams, and rainwater.

Just under 60 percent of the population acquires water from a protected source in the dry season. This includes most of the urban population of Malawi. In rural areas, however, considerable variation is seen in the provision of safe water, with Kasungu and Ntchisi districts having the greatest need for improvements in safe water provision.



0 20 40 60 80 100 Kilometers



* national rate

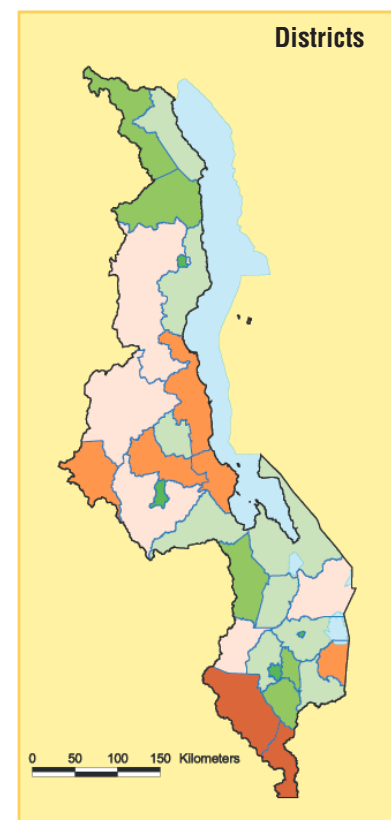
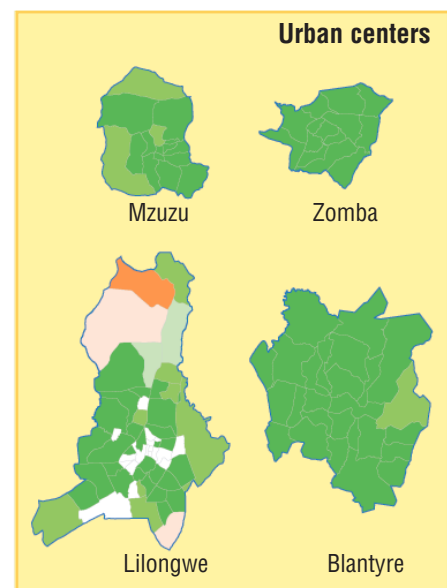
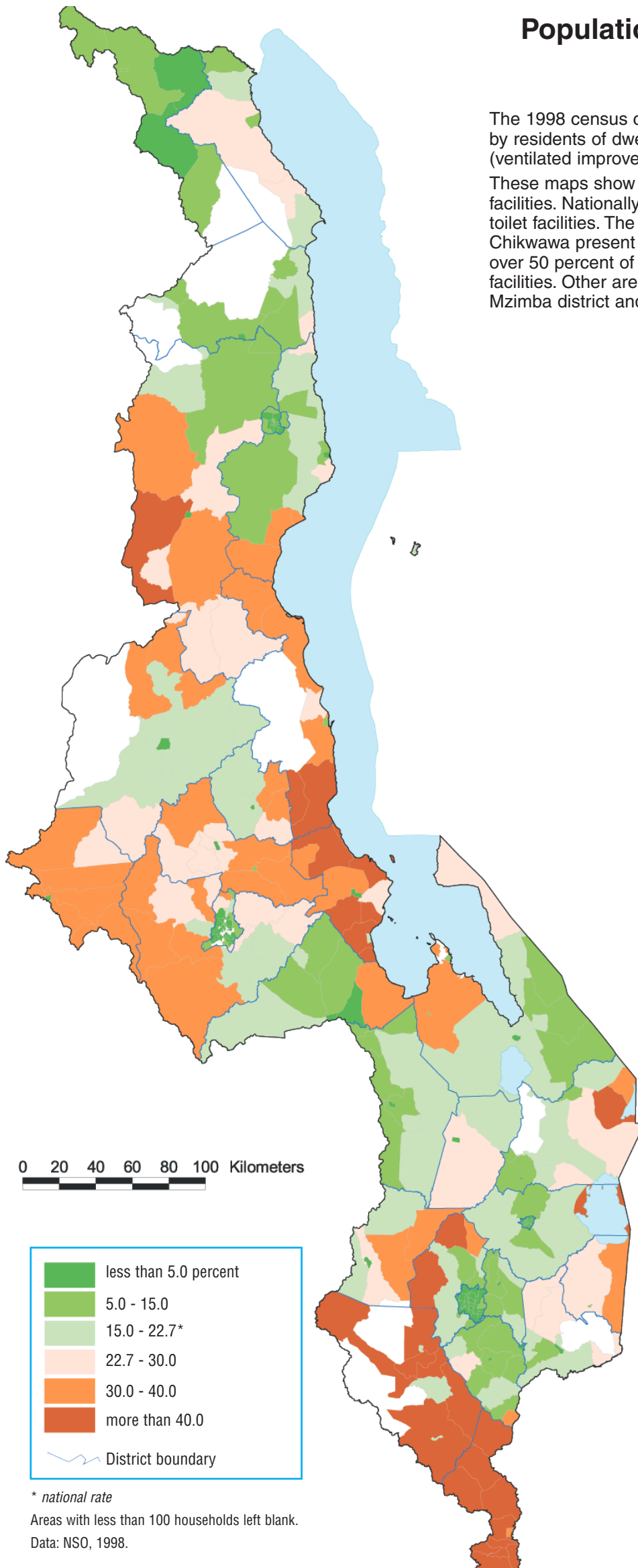
Areas with less than 100 households left blank.

Data: NSO, 1998.

Population without toilet facilities

Malawi 1998

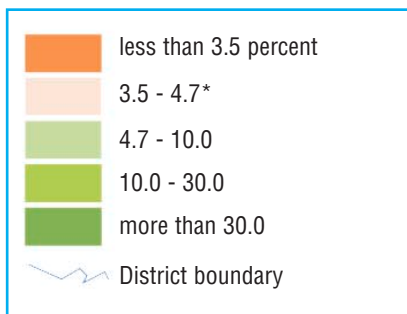
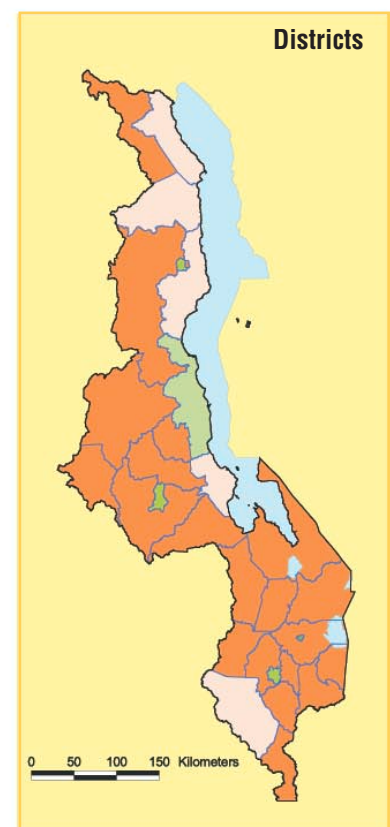
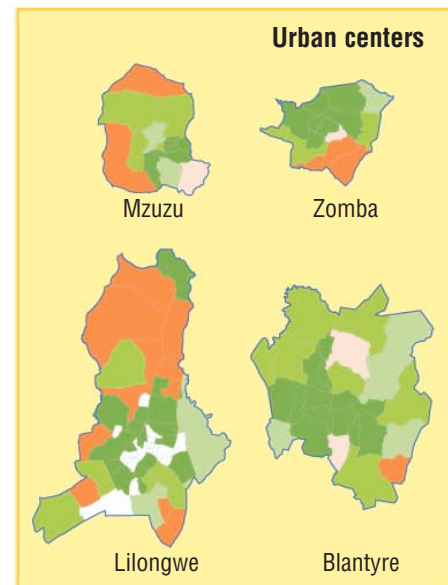
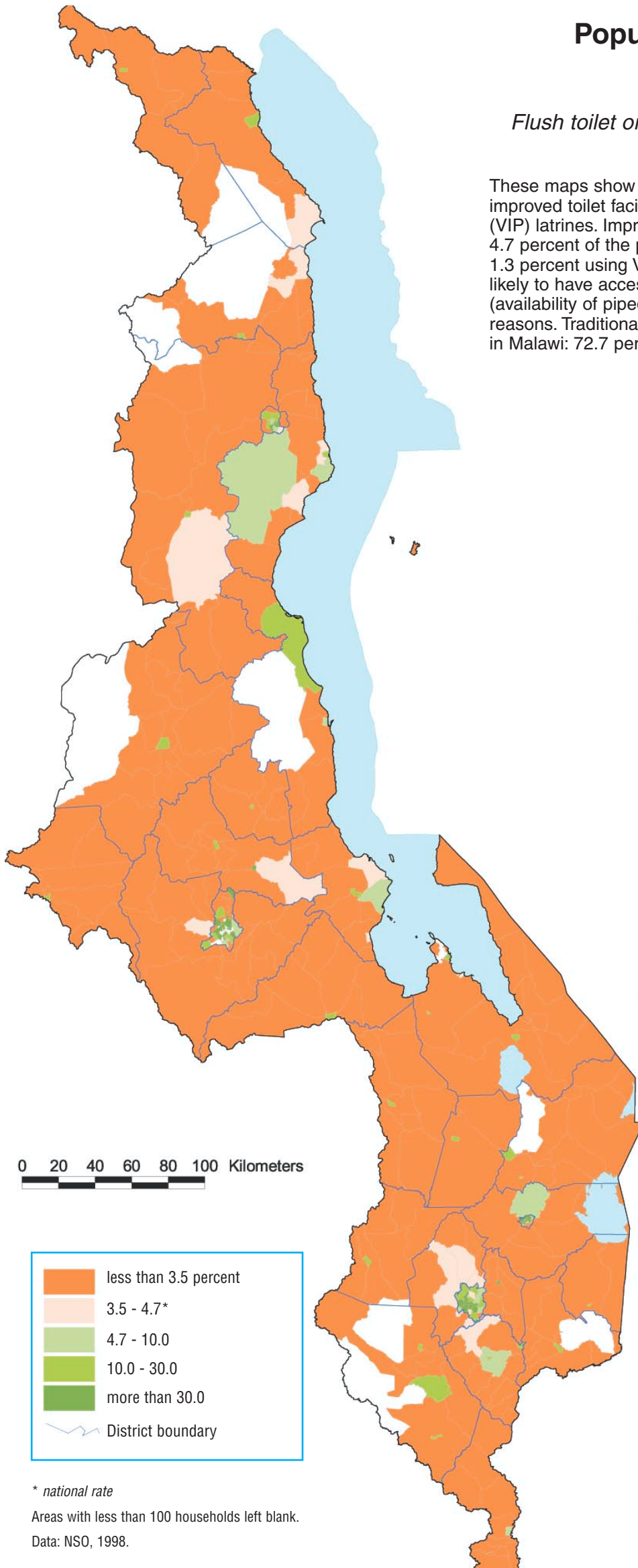
The 1998 census collected information on the toilet facilities used by residents of dwellings, categorized as flush toilets, VIP (ventilated improved pit) latrines, traditional pit latrines, or none. These maps show the proportion of the population without toilet facilities. Nationally 22.7 percent of the population was without toilet facilities. The lower Shire valley districts of Nsanje and Chikwawa present the greatest need for improved sanitation, with over 50 percent of the population in both districts having no toilet facilities. Other areas in need of improved sanitation are parts of Mzimba district and the central lakeshore.



Population with improved toilet facilities

Flush toilet or Ventilated Improved Pit (VIP) latrine
Malawi 1998

These maps show the proportion of the population using improved toilet facilities: flush toilets and ventilated improved pit (VIP) latrines. Improved toilets are uncommon, available to only 4.7 percent of the population - 3.4 percent using flush toilets and 1.3 percent using VIP latrines. The urban population is the most likely to have access to such facilities, both for technical reasons (availability of piped water for flush toilets) and for economic reasons. Traditional latrines are the most common toilet facilities in Malawi: 72.7 percent of the population uses them.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.

Cooking fuel

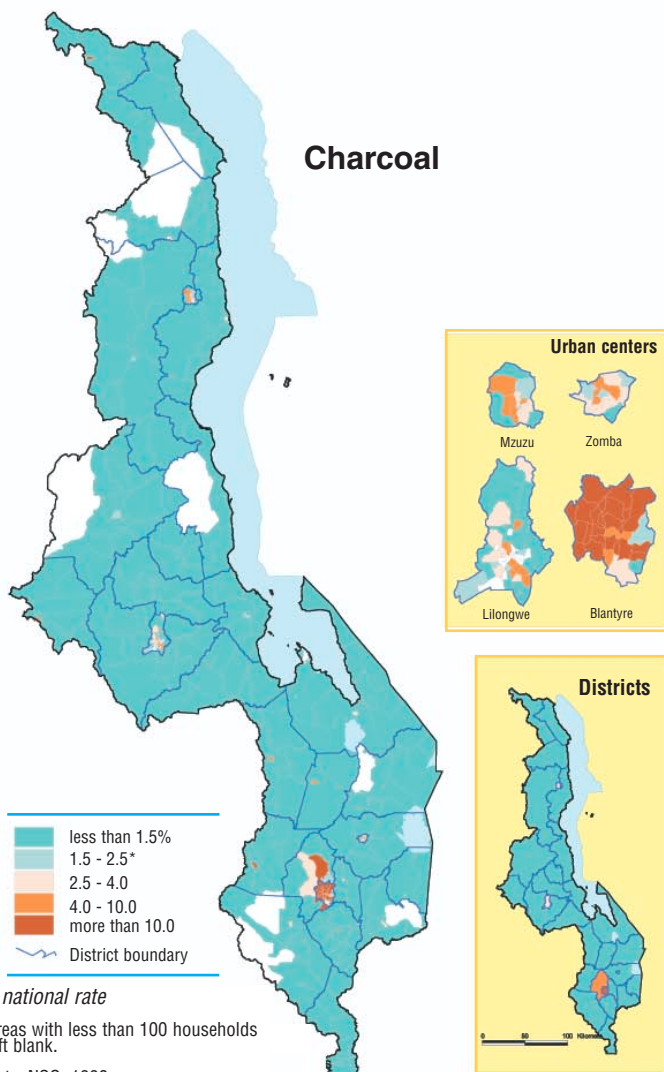
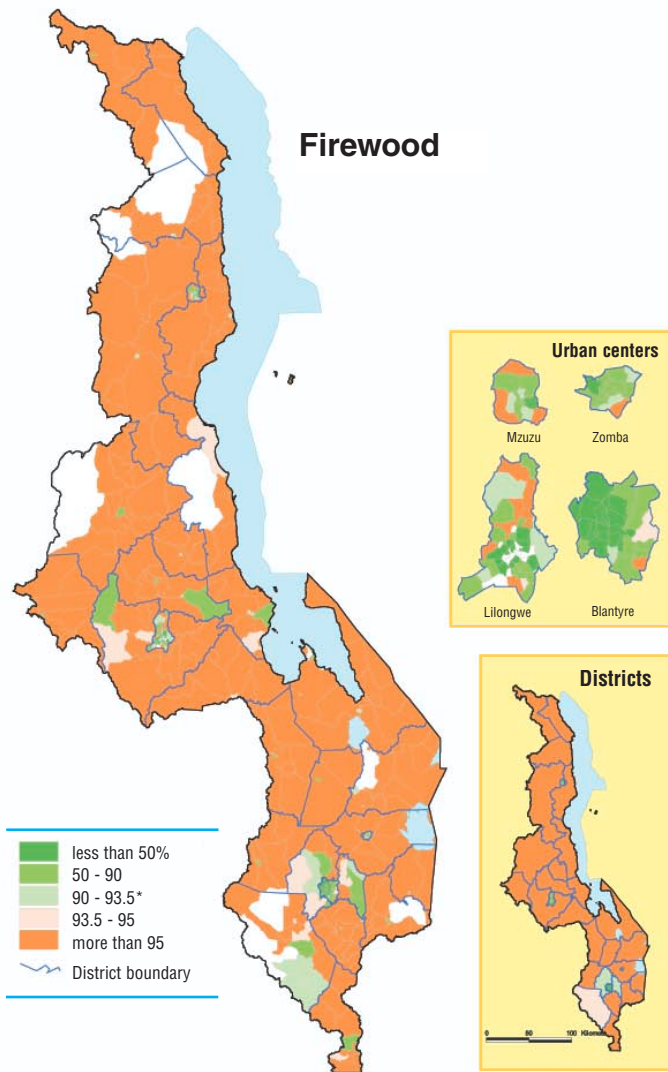
Percent of population using a particular fuel for cooking

Malawi 1998

The 1998 census collected information on the main source of energy used by residents of a dwelling unit for both cooking and lighting. These maps show the proportion of the population using a particular energy source for cooking.

Nationally, firewood is the most common source of cooking fuel, with 93.5 percent of the population using it. This proportion is somewhat less in most of the urban centers, but it is still high with over 75 percent of the population using firewood in Lilongwe, Mzuzu, and Zomba. The proportion only falls below half the population (44 percent) in the city of Blantyre.

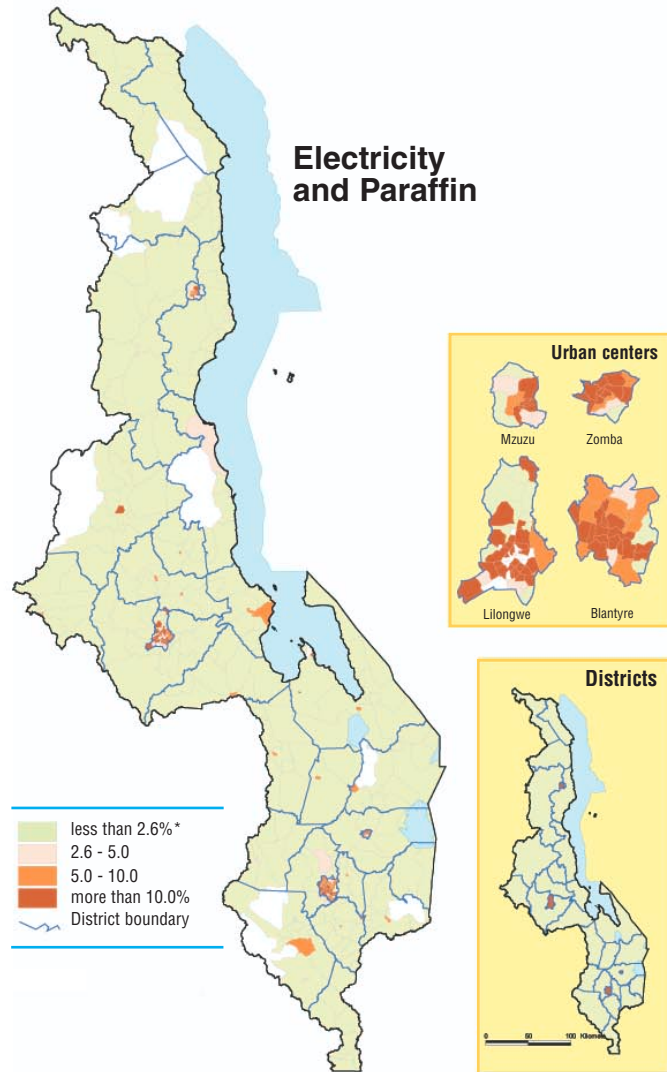
The primary alternative fuel used for cooking is charcoal, common in the urban centers (particularly in the city of Blantyre where 38 percent of the residents report using it) but uncommon in the rural areas where it is produced. Electricity and paraffin were reported to be used by only 2.6 percent of the population - 2.2 and 0.4 percent respectively. Although these fuels are more commonly used for cooking in urban areas, even there their use is relatively restricted. Less than 20 percent of the total population in the four urban centers reported using electricity or paraffin for cooking. Lilongwe city has the highest usage rate at 20.2 percent.



* national rate

Areas with less than 100 households left blank.

Data: NSO, 1998.



Lighting fuel

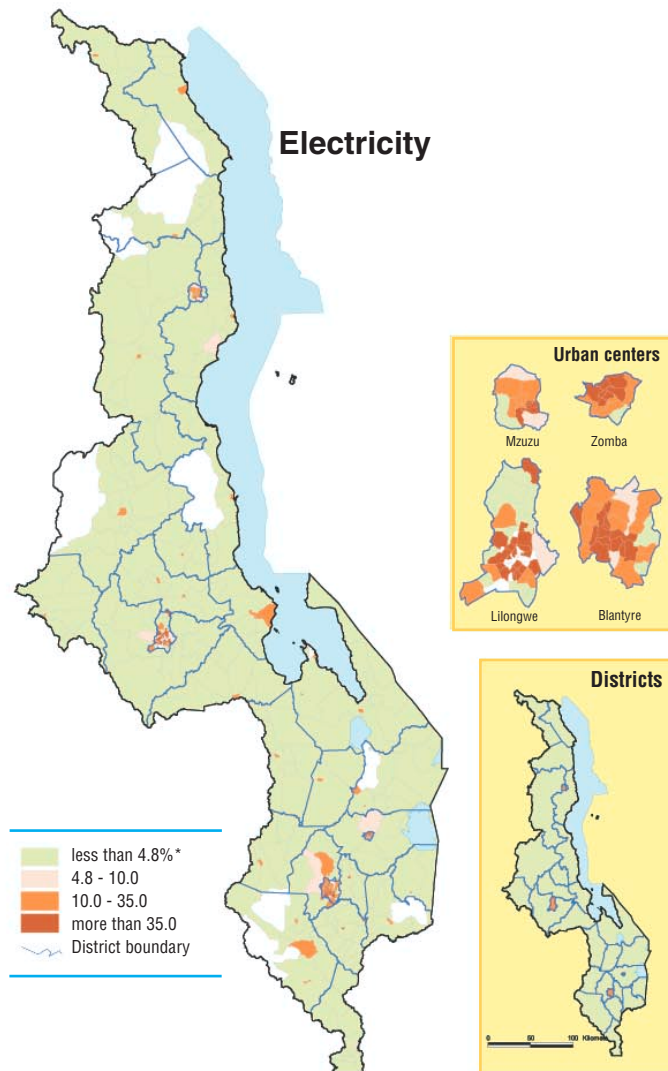
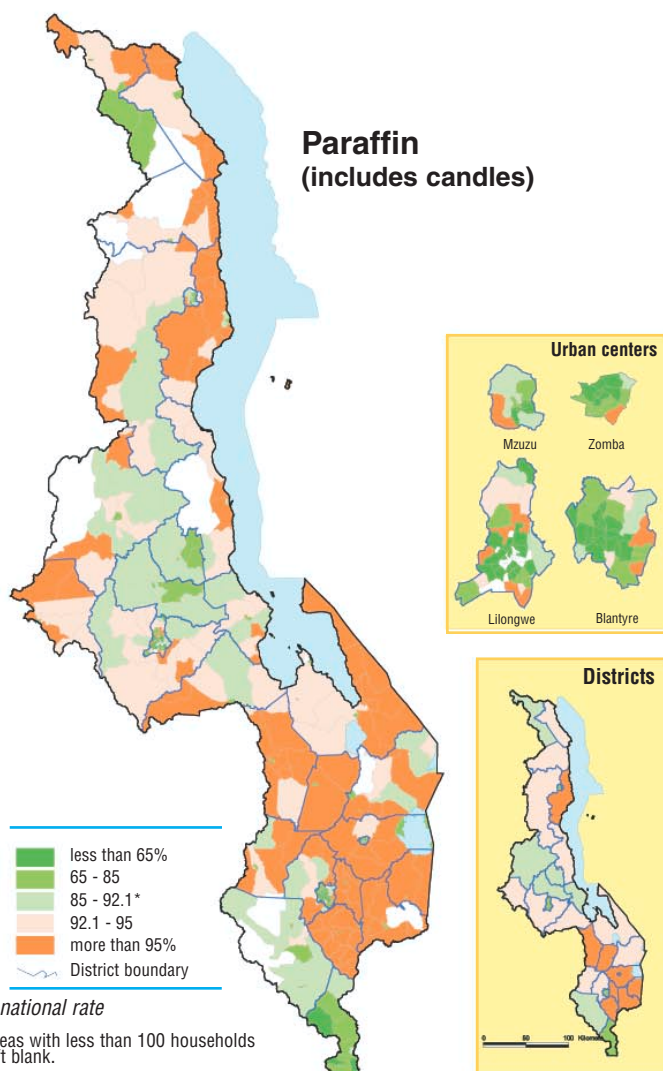
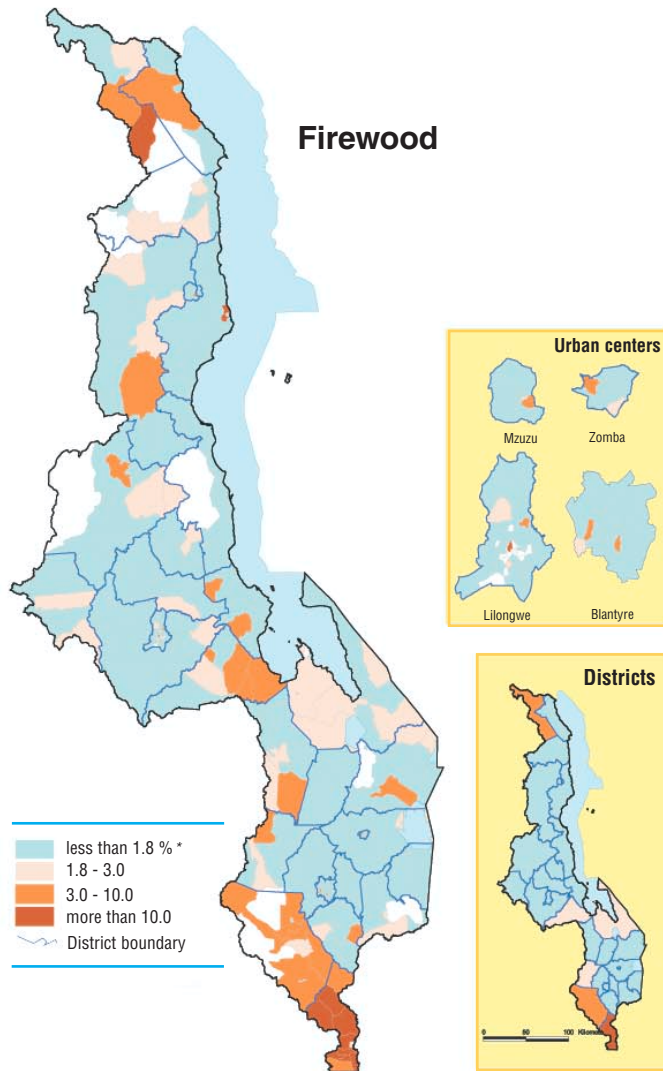
Percent of population using a particular fuel for lighting

Malawi 1998

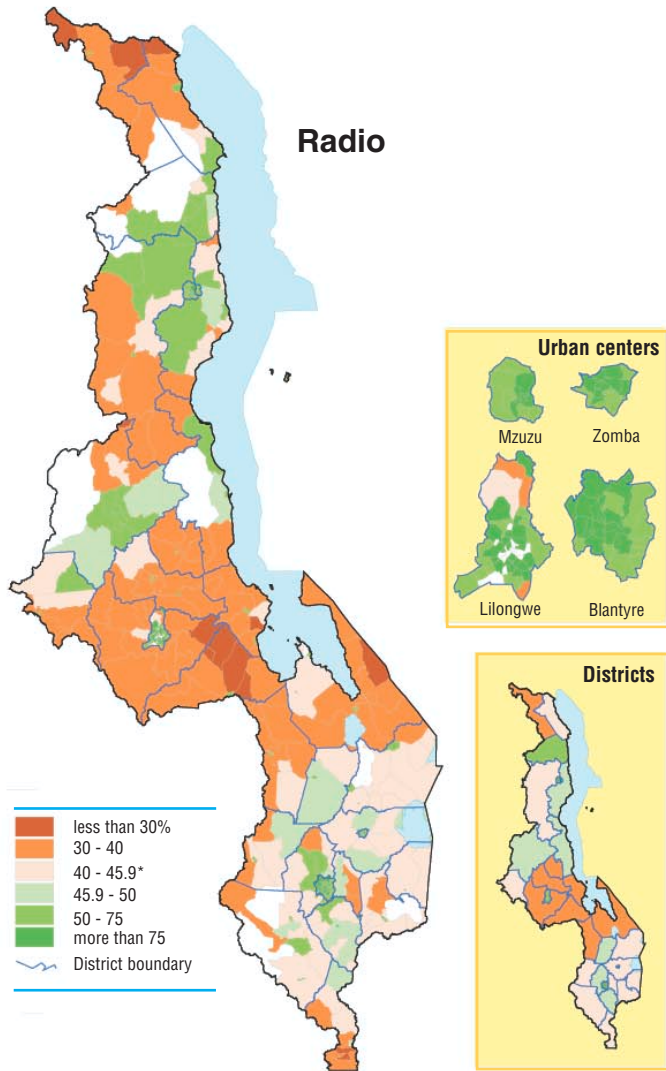
These maps show the proportion of the population using a particular energy source to light their homes. While firewood is commonly used for cooking it is not used for lighting: only 1.8 percent of the population lights their dwelling with wood. Wood is more common as a lighting source in the remote areas of the Chitipa district and in the Nsanje and Chikwawa districts of the lower Shire valley.

Liquid paraffin in hurricane and pressure lamps is the most common fuel used for lighting in Malawi: about 92 percent of the population uses this method. In addition, 0.5 percent of the population uses paraffin wax candles as their principal source of lighting.

Electricity is only readily available in the urban centers, where it is a common source of lighting. Electricity is more commonly used in the urban centers for lighting than it is for cooking (30 percent compared with 20 percent). Nationally, only 4.8 percent of the population lights their homes with electricity.



* national rate
Areas with less than 100 households left blank.
Data: NSO, 1998.



Ownership of radio, bicycle or ox-cart

Percent of population that has item in their dwelling unit

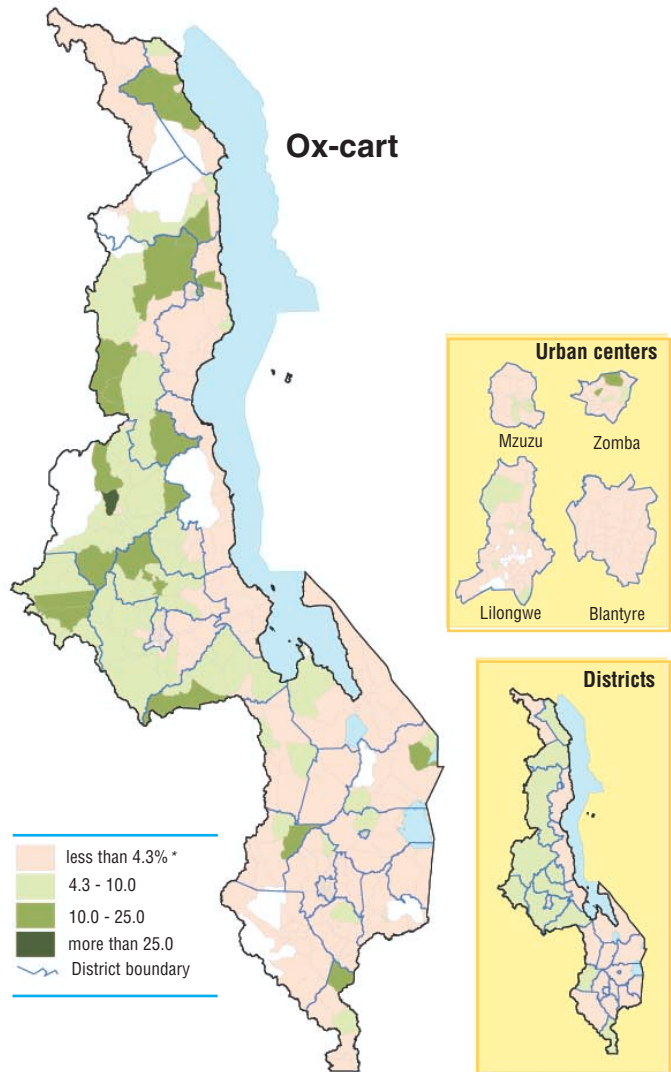
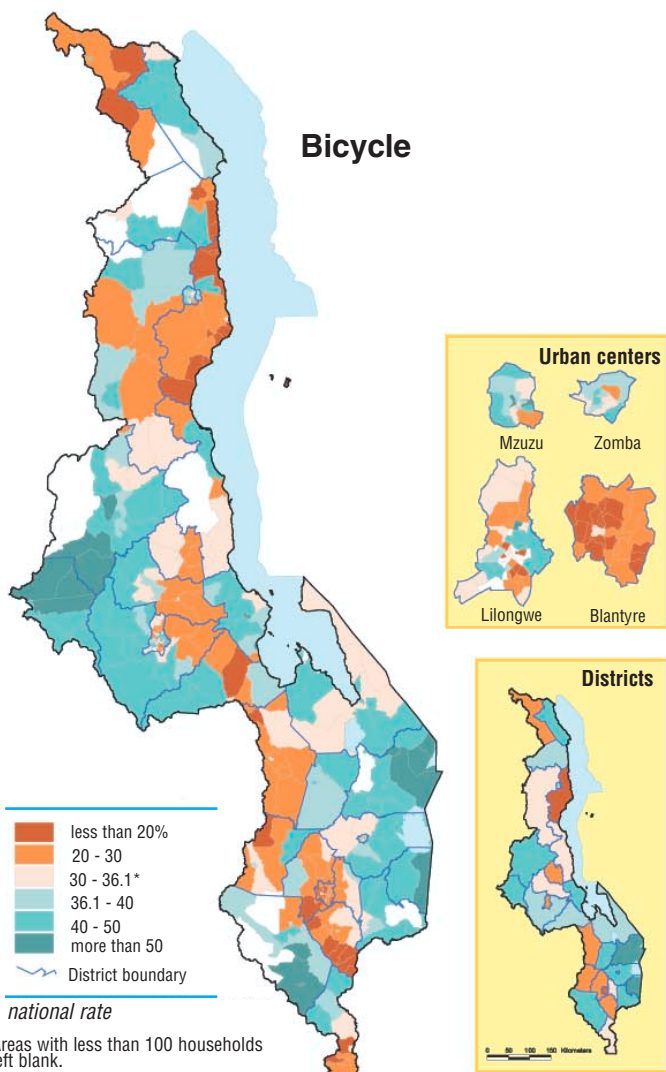
Malawi 1998

The 1998 census collected information on whether individuals in a dwelling unit owned a working radio, a bicycle, or an ox-cart. The proportion of the population living in dwelling units in which these items are found is shown in these maps.

The proportion of the population residing in dwellings with a working radio is 45.9 percent. More than three-quarters of all urban residents have access to a radio in their house. The population in the rural districts of central Malawi is the least likely to have access to a radio (about 40 percent reported having no radio in their dwelling).

Bicycles are less common than radios: 36.1 percent of the population dwells in units that own a bicycle. There is not a strong pattern to bicycle ownership, beyond being uncommon in Blantyre City; Thyolo, Chitipa, and Nkhata Bay districts; and in the hill and escarpment areas of Mwanza district and the Central region.

Ox-carts are uncommon in Malawi. Where they are most common (the upland plateau areas of the central and northern regions), they are present in less than 10 percent of the population's dwellings.



* national rate

Areas with less than 100 households left blank.

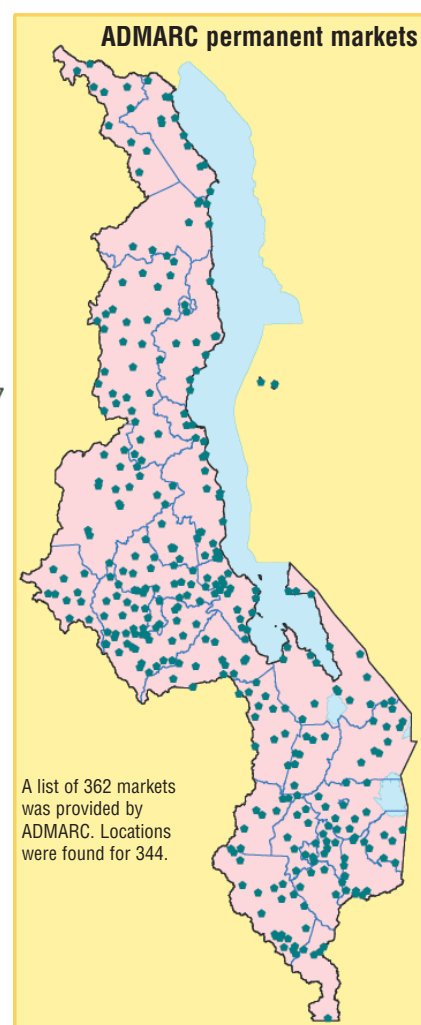
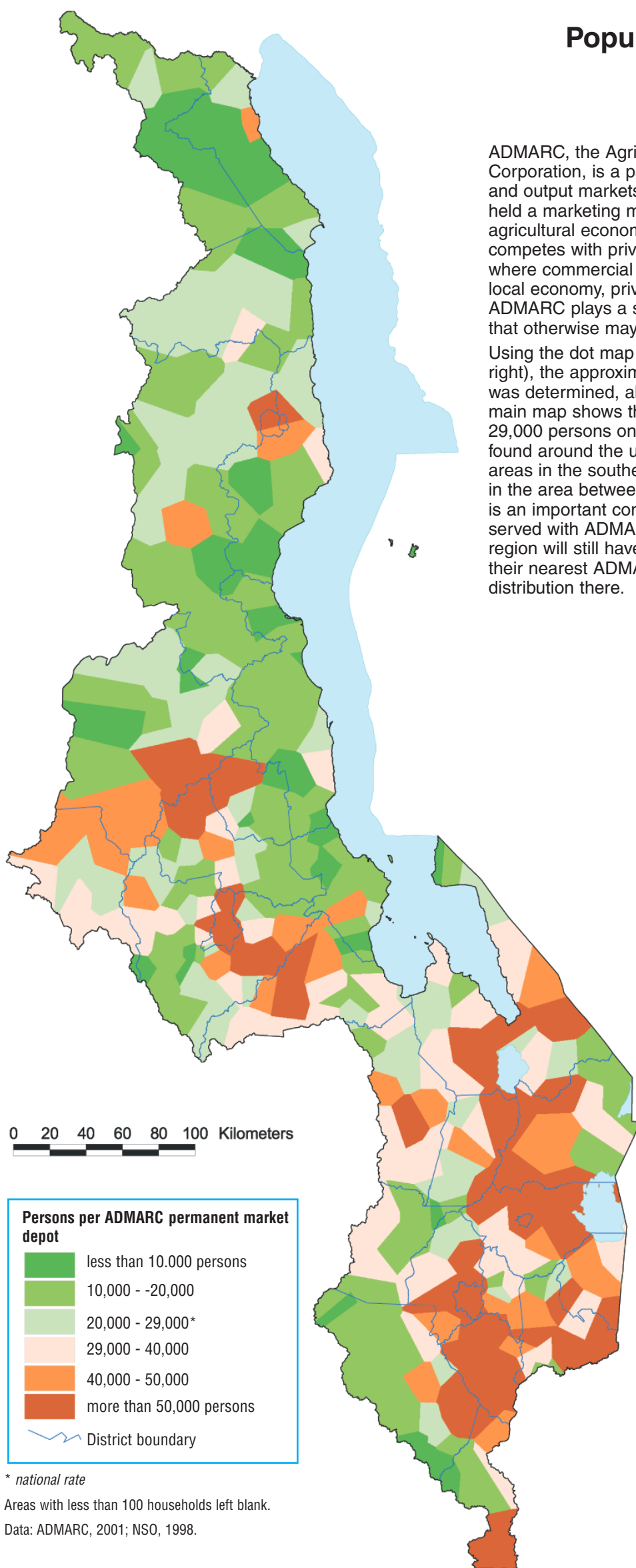
Data: NSO, 1998.

Population served by each ADMARC depot

Malawi 1998

ADMARC, the Agricultural Development and Marketing Corporation, is a parastatal organization that provides both input and output markets for smallholder farmers. While at one time it held a marketing monopoly, with the liberalization of the agricultural economy in Malawi in the mid-1990s, ADMARC now competes with private market traders. However, in remote areas where commercial agriculture is not an important part of the local economy, private traders are uncommon. In these areas ADMARC plays a social function in providing marketing services that otherwise may not be available.

Using the dot map of ADMARC permanent market depots (lower right), the approximate area served by each ADMARC depot was determined, along with the population residing in each. The main map shows the results. Overall, each depot serves about 29,000 persons on average. Higher populations per depot are found around the urban centers, the more densely populated areas in the southern region, and parts of central region (notably in the area between Kasungu and Mponela). However, distance is an important consideration. Despite being relatively well served with ADMARC facilities, households in the northern region will still have to cover considerable distances to reach their nearest ADMARC, given the relatively sparse population distribution there.



* national rate

Areas with less than 100 households left blank.

Data: ADMARC, 2001; NSO, 1998.

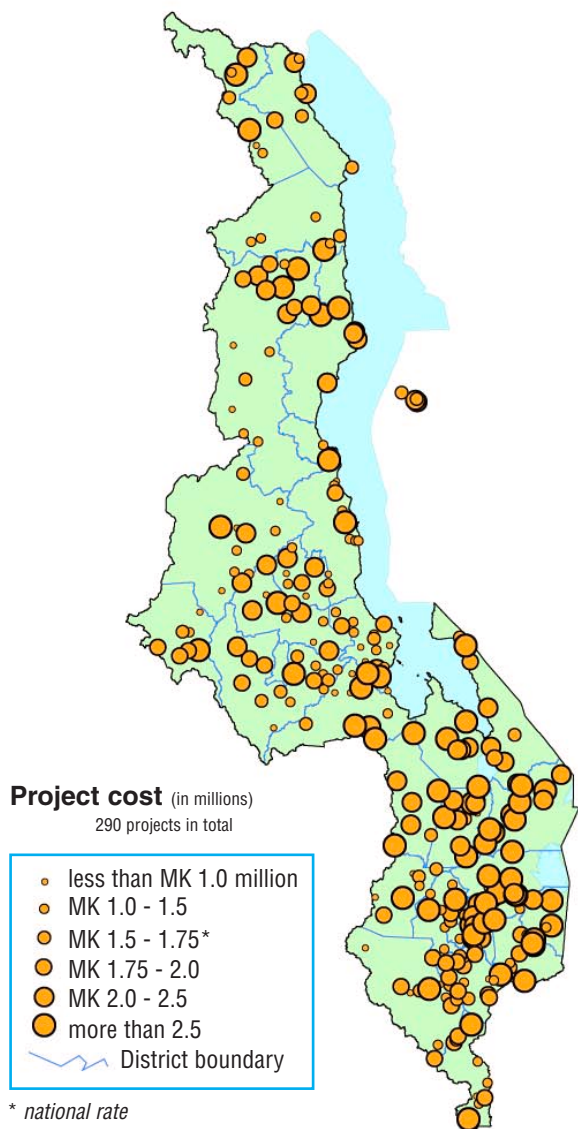
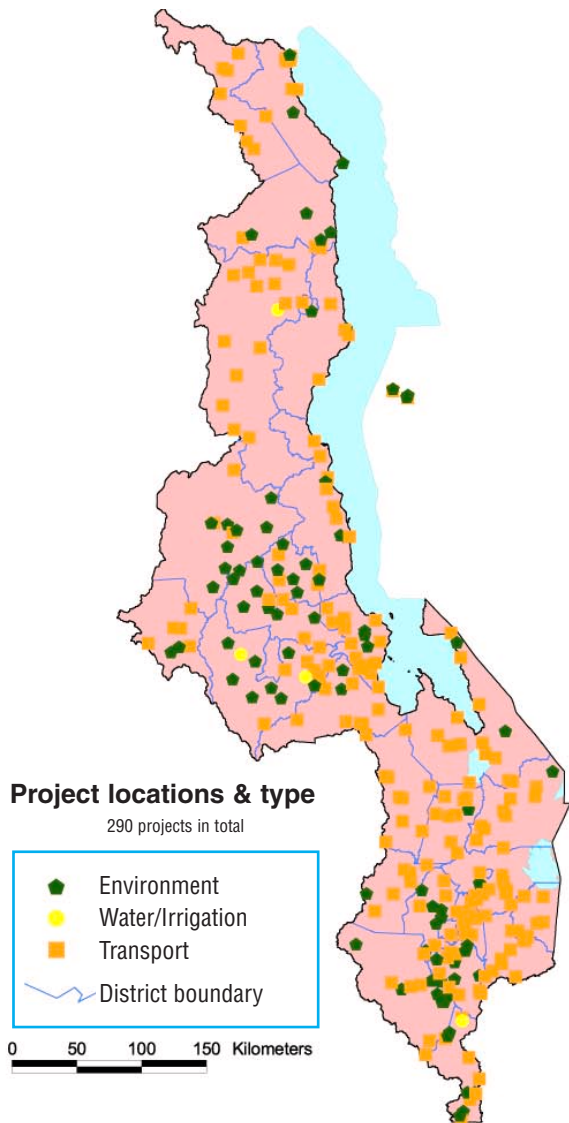
Malawi Social Action Fund (MASAF)

Malawi 1998 - 2001

The Malawi Social Action Fund (MASAF), which began in 1995, was designed by the Government of Malawi with the support of the World Bank as a poverty alleviation program responding to the needs and demands of the country's rural poor. A principal component of MASAF's activities has been the Public Works Program (PWP) through which relatively low-wage employment is provided to the rural poor through rural infrastructure development projects. The bulk of the projects consist of road-building, afforestation, and environmental rehabilitation projects. A handful of water projects have also been completed.

These three maps present aspects of the performance of the MASAF PWP component over 1998-2001. Using project listings, the 290 project sites were located and mapped. The maps show the kinds of projects carried out at each site, their cost, and the number of households directly benefiting from the project through the employment of a household member. The median project cost was approximately MK1.75 million (about US\$37,000), and on average 300 individuals found employment with each project. Of course, many more households benefited indirectly from these projects through improved infrastructure.

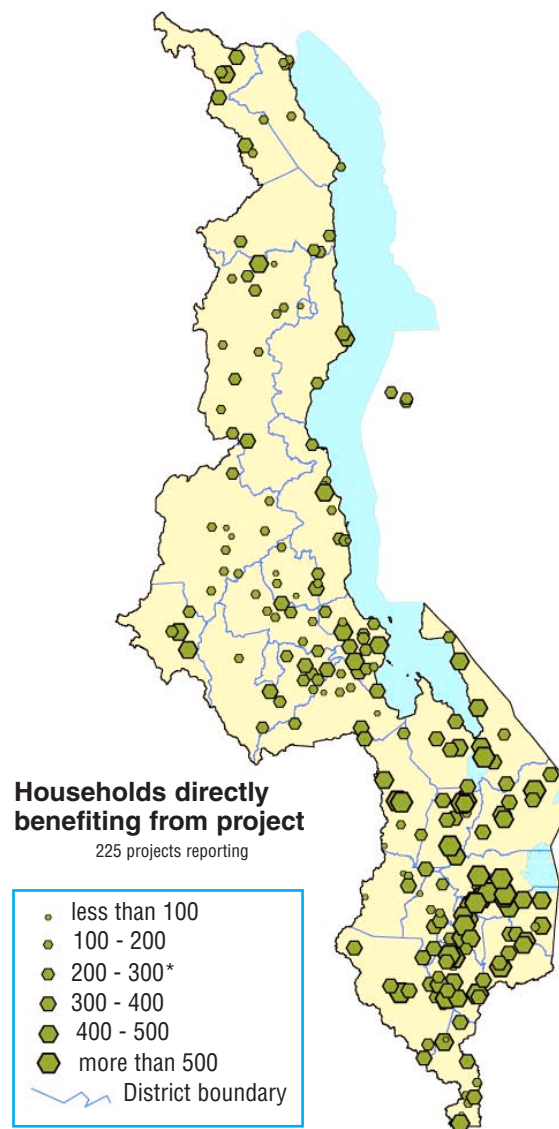
More than MK570 million (about US\$12 million) was spent, and more than 85,000 households directly benefited from the projects over the four years. Although the distribution of the projects across the country is quite even, the magnitude of the effort is dwarfed by the size of the Malawi's poverty problem: over 1.2 million households are below the poverty line. Many more similar projects are required for poverty to be effectively reduced.



* national rate

Areas with less than 100 households left blank.

Data: MASAF-PWP; no date.

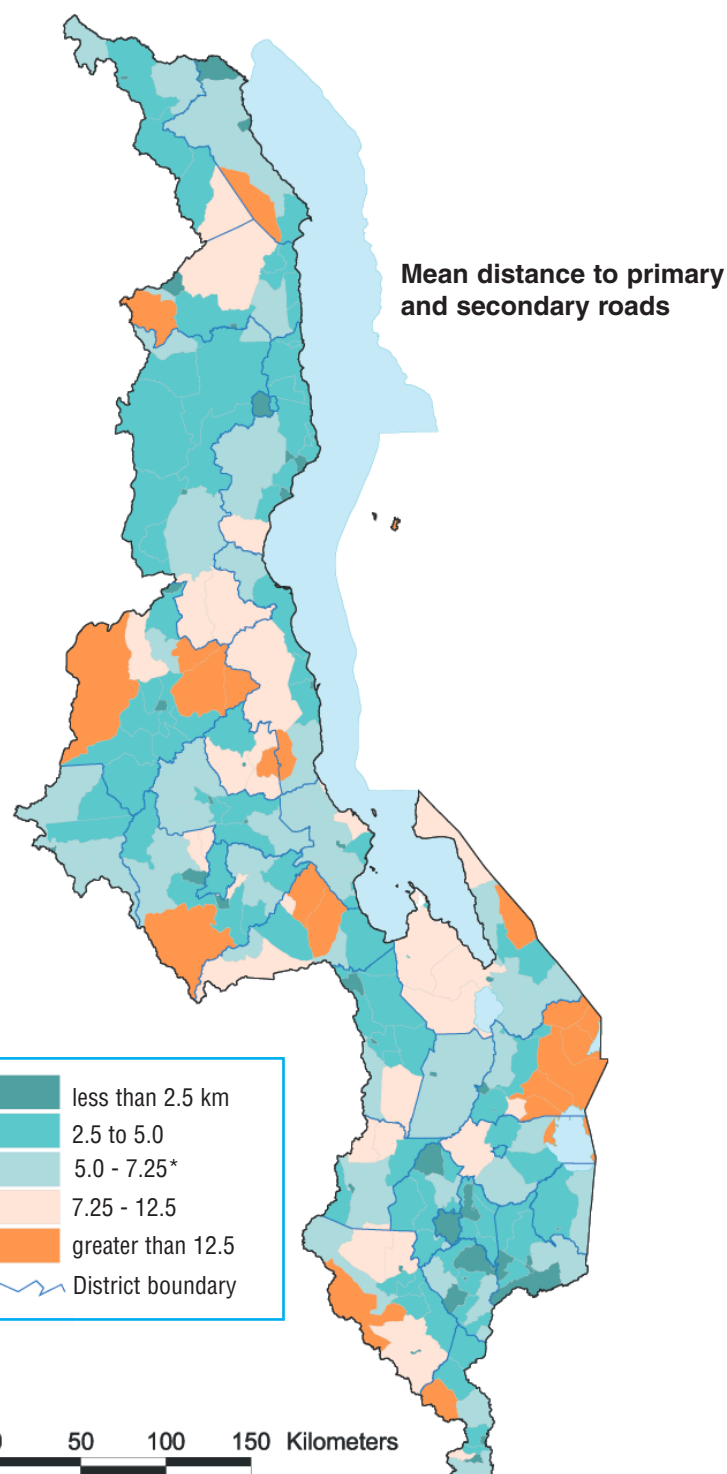
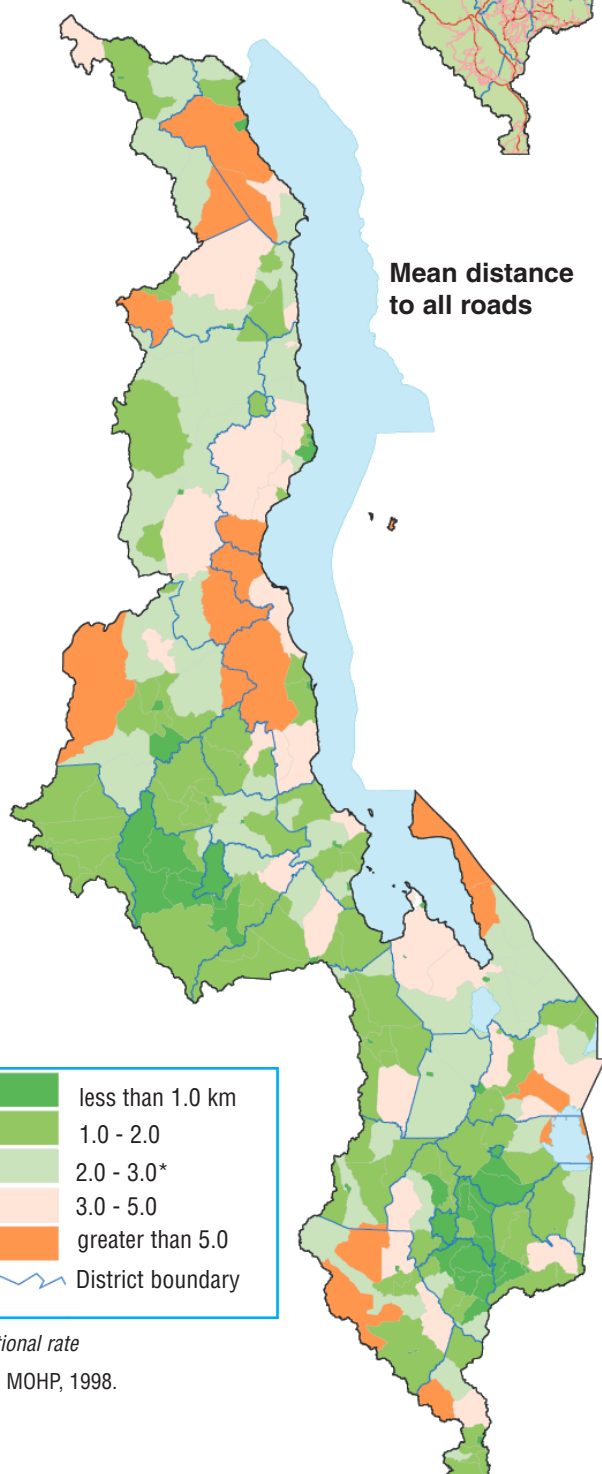
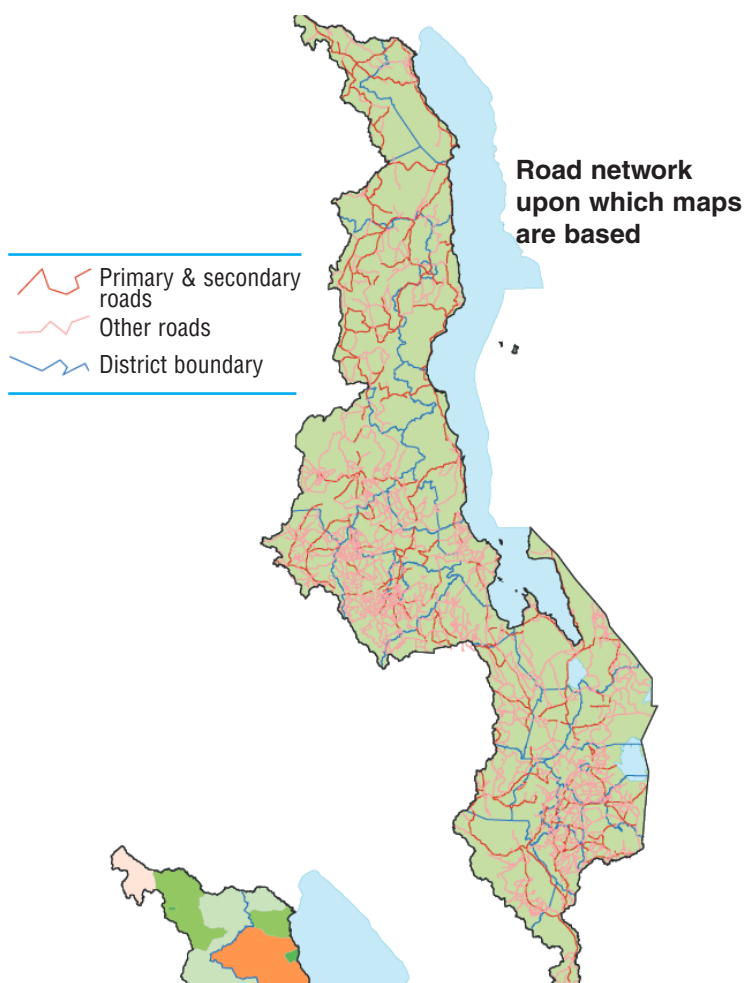


Distance to nearest road

Malawi 1998

One measure of the relative ease by which Malawians can travel, trade, and enjoy the benefits of interaction with others outside of their local area is the distance they face in getting to the nearest road. The two maps below show the average distance to the nearest road from all points within the TA or ward. The map at left considers all roads; the map at right only the major roads.

While these maps should only be considered as indicative because the underlying data quality is less than optimal, most populated areas appear to have similar levels of access. Only the relatively sparsely populated escarpment zones and national parks and forests stand out as areas with disproportionately poor access.

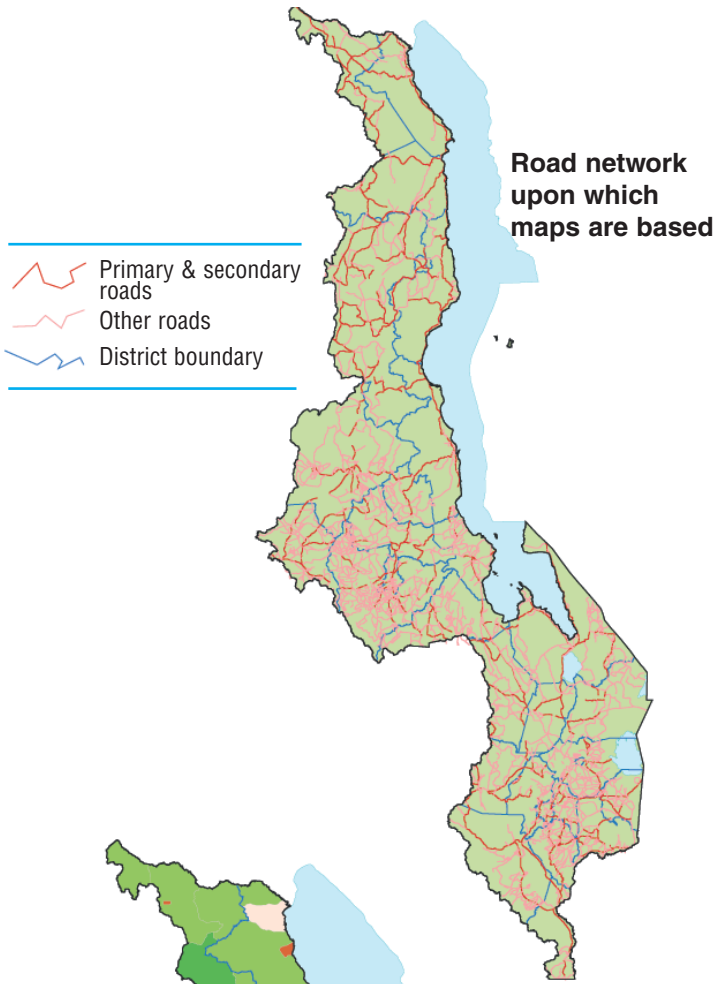


* national rate
Data: MOHP, 1998.



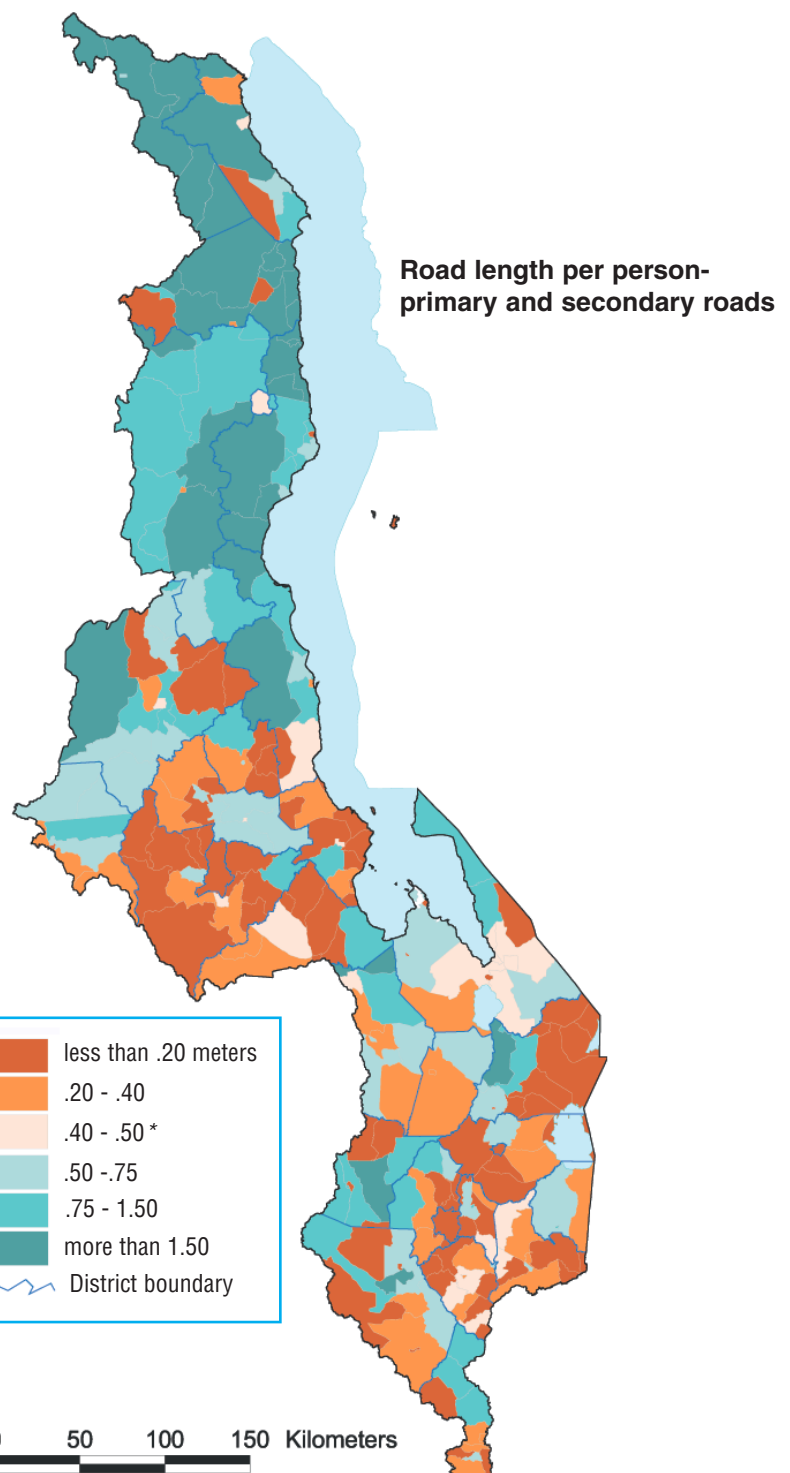
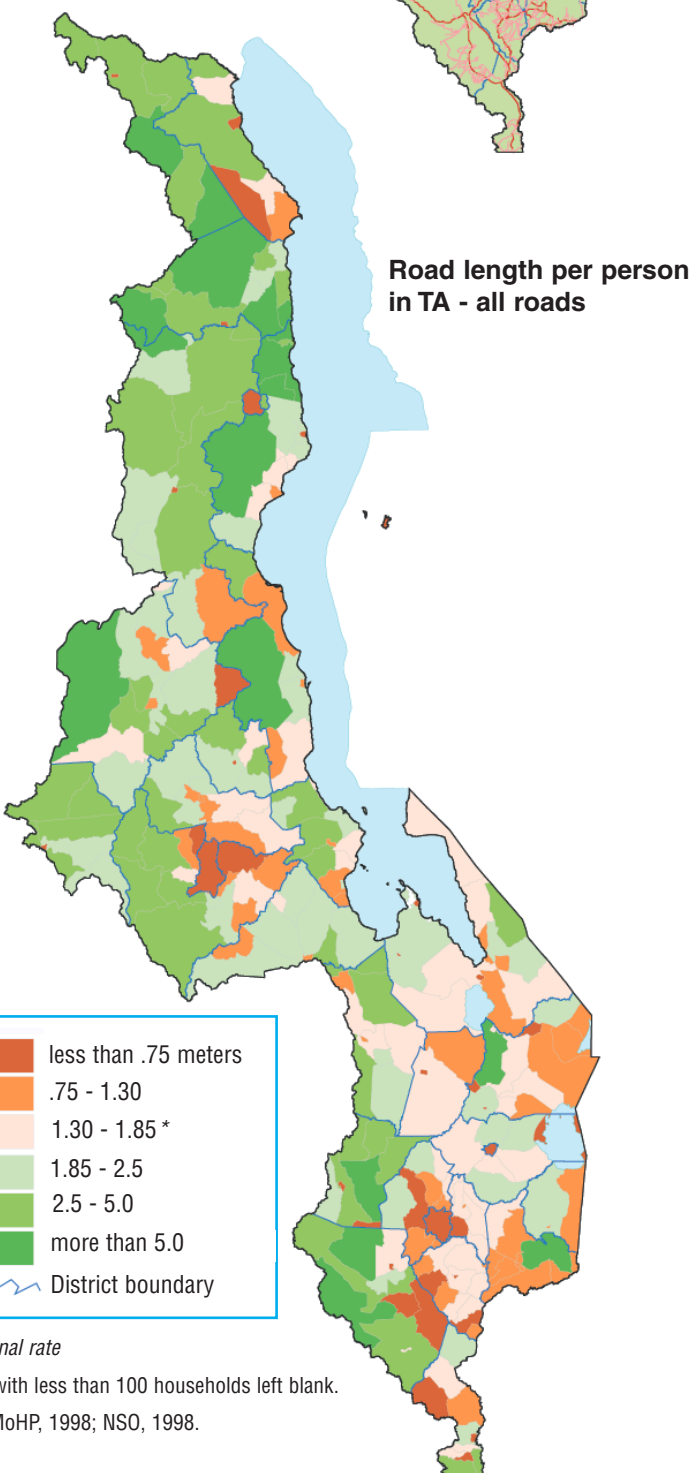
Road length per person

Malawi - 1998



Another indicator of the mobility of the population is the length of road per person in a given area. The two maps below show the average length of road per person within a TA or ward. Once again, the map at lower left considers all roads, the map at right only major roads. Again, the maps should be considered as indicative only because the underlying data quality is less than optimal. (The total length of the national road system shown here is about 18,500 km, whereas other road statistics on Malawi give a figure of 27,800 km.)

Overall, road development is quite low, with only about one or two meters of road per person in most areas. In densely populated areas, however, this level may be adequate, and the more important issue is the quality of the roads.



* national rate

Areas with less than 100 households left blank.

Data: MoHP, 1998; NSO, 1998.



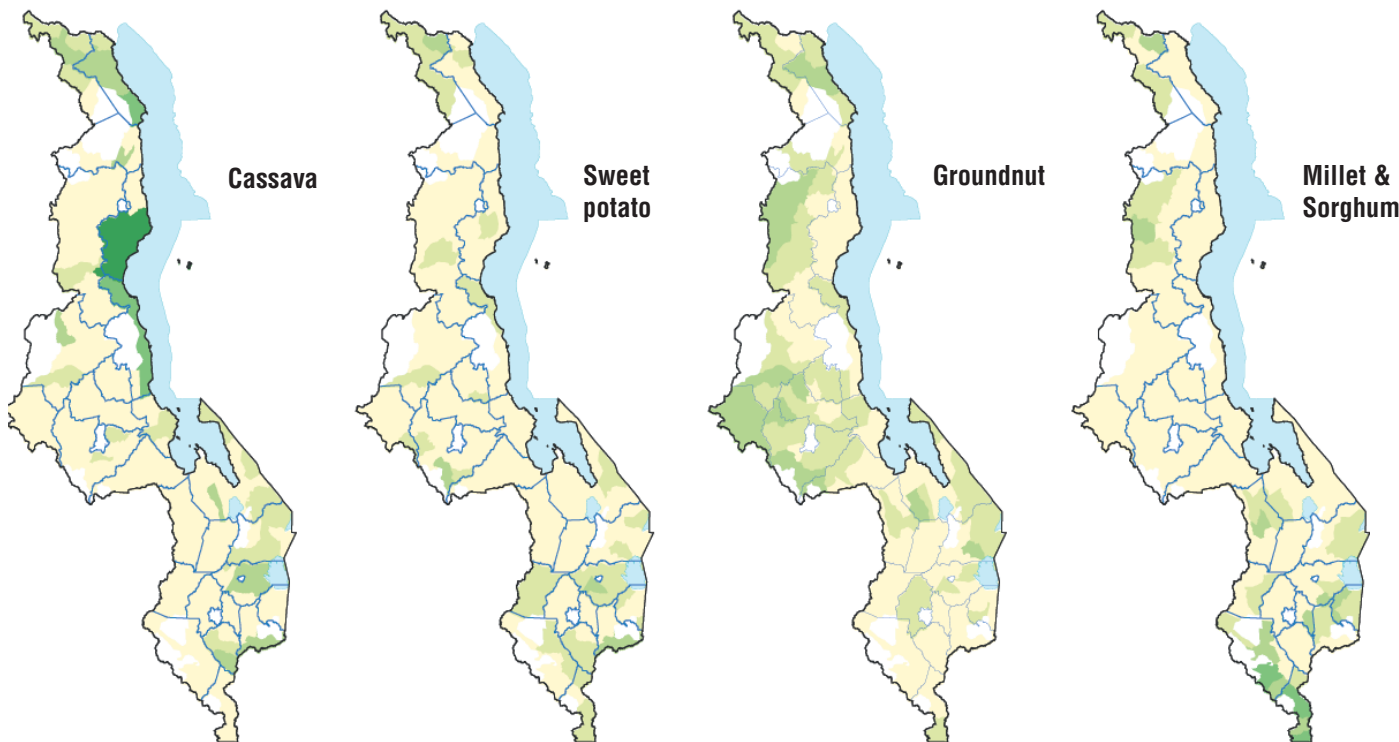
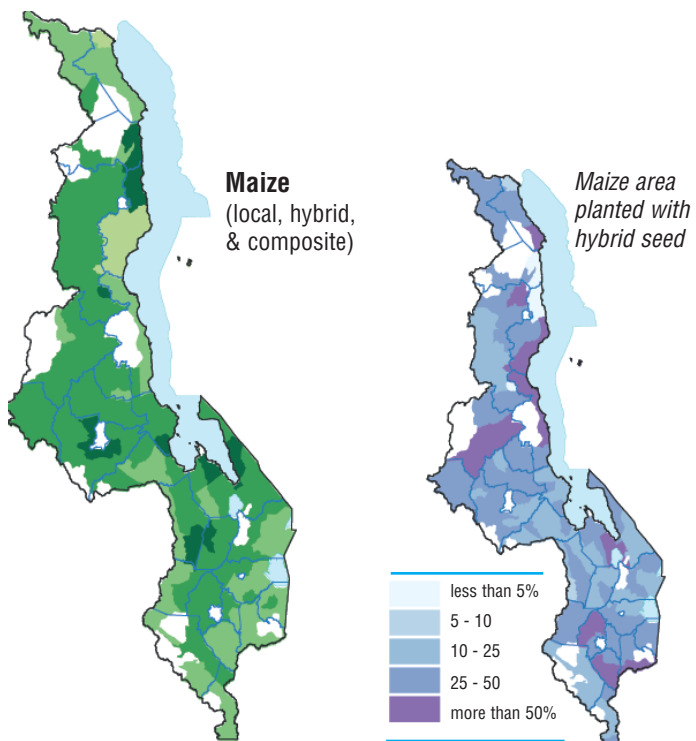
Smallholder farmer cropped area, by crop

Malawi - 1995/96 to 1999/2000 cropping seasons

During the course of each rainy season, the Ministry of Agriculture and Irrigation estimates the crops grown by smallholder farmers in each of the 154 extension planning areas (EPAs), as well as larger spatial units. These maps use EPAs to show the proportion of the total smallholder crop area sown to a specific crop over the period 1995/96 to 1999/2000. The average national area estimated to be cropped annually by smallholders over this period was 2.42 million hectares. Of this area, the percentage occupied by each crop was estimated to be.

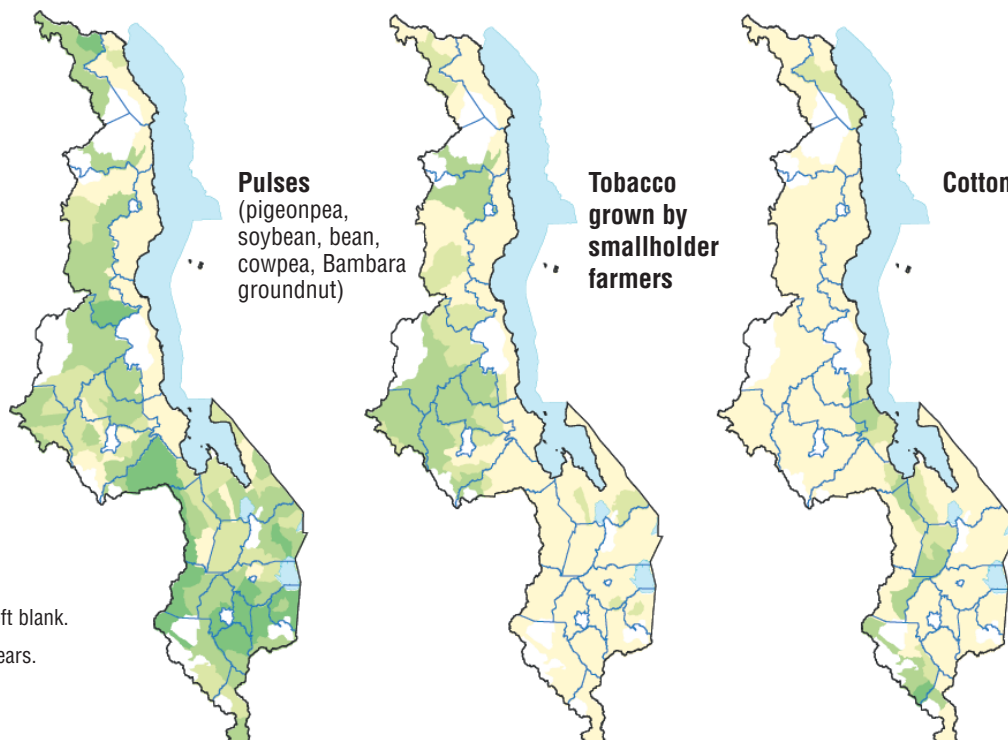
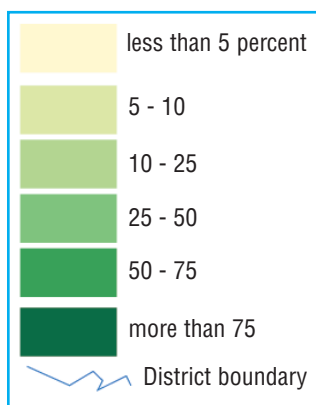
maize: 53.8	cassava: 6.0	sweet potato: 5.1
groundnut: 5.4	millet & sorghum : 4.1	pulses: 16.8
tobacco: 4.5	cotton: 2.3	other crops: 2.1

The smaller map at left shows the percentage of the maize area estimated to have been planted with hybrid seed (31.6 percent). Note that the area cropped on commercial agricultural estates is not included in these estimates.



Extension Planning Area (EPA)

0 50 100 150 200 Kilometers



Areas with less than 100 households left blank.

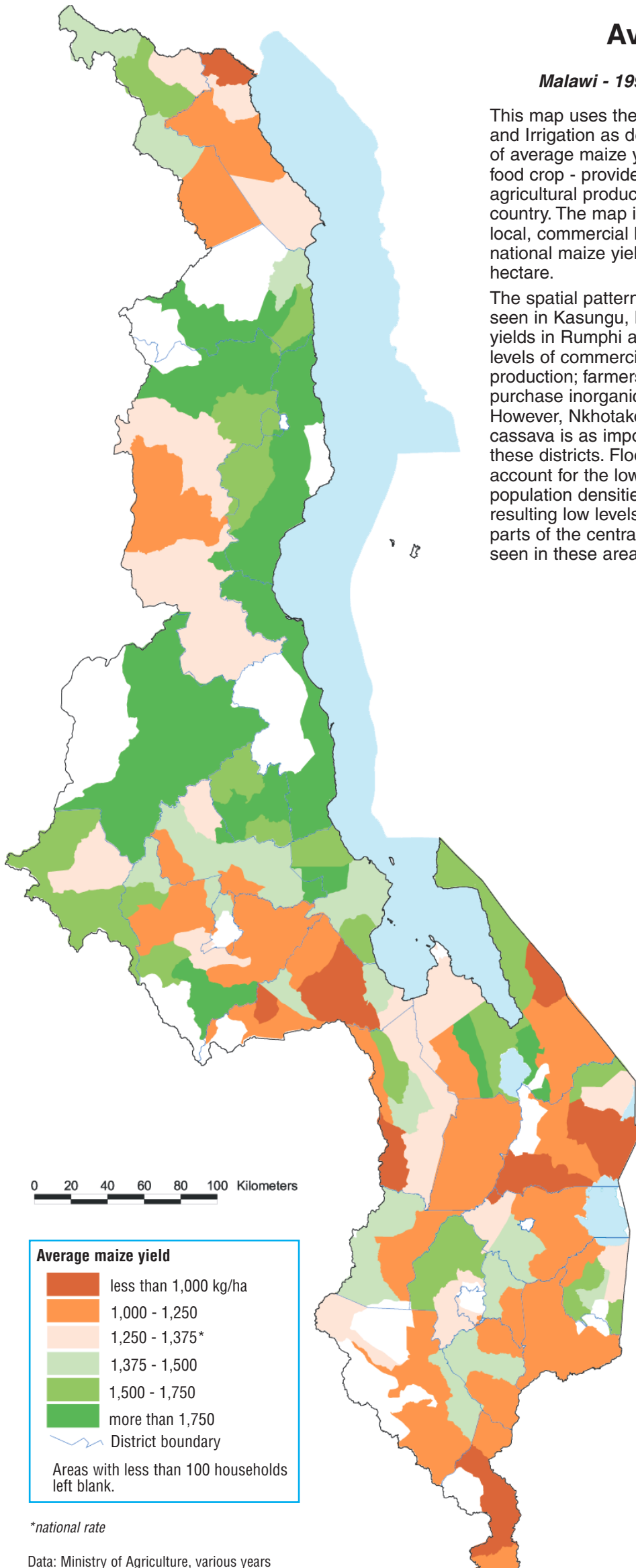
Data: Ministry of Agriculture, various years.

Average maize yield

Malawi - 1995/96 to 1999/2000 cropping seasons

This map uses the same data from the Ministry of Agriculture and Irrigation as described on the previous page. The pattern of average maize yields - maize being Malawi's principal staple food crop - provides an indication of the general level of agricultural productivity on smallholder farms across the country. The map incorporates yield data for all maize types: local, commercial hybrid, and composite varieties. The mean national maize yield over this period was 1,375 kilograms per hectare.

The spatial pattern is difficult to interpret. Highest yields are seen in Kasungu, Nkhatakota, Nkhata Bay, and Rumphi. Higher yields in Rumphi and Kasungu may be the result of the higher levels of commercial agriculture associated with tobacco production; farmers in these areas may be better able to purchase inorganic fertilizer for their maize in consequence. However, Nkhatakota and Nkhata Bay are exceptional in that cassava is as important as maize in the diet for residents of these districts. Flooding over the period in question may account for the low yields seen in the lower Shire valley. High population densities, continual cropping of the land, and resulting low levels of soil fertility in the southern region and parts of the central region may underlie the relatively low yields seen in these areas.



0 20 40 60 80 100 Kilometers

Average maize yield

- less than 1,000 kg/ha
- 1,000 - 1,250
- 1,250 - 1,375*
- 1,375 - 1,500
- 1,500 - 1,750
- more than 1,750

District boundary

Areas with less than 100 households left blank.

*national rate

Data: Ministry of Agriculture, various years

POVERTY MAPPING - A TECHNICAL DESCRIPTION

Poverty mapping involves identifying relationships between household characteristics and households welfare levels revealed by the analysis of a detailed living standards measurement survey (LSMS). One then applies a model of these relationships to data on the same household characteristics contained in a national census to determine the welfare level of all households in the census. The resulting estimates of household welfare and poverty derived from the census are spatially disaggregated to a much higher degree than is possible using survey information, providing an enhanced understanding of the spatial dimensions of poverty.

In late 2000 the poverty analysis of the 1997-98 Integrated Household Survey (IHS) was completed, providing estimates of the incidence and severity of poverty in Malawi, together with a close analysis of how poverty is correlated with a range of household characteristics. The IHS is an LSMS-type survey, which was administered in all districts of the country over a twelve month period. It contains detailed consumption and expenditure information, as well as a wide range of other data on the surveyed households. It is a rich source, although it is limited to the extent that it is a sample, and can only provide estimates of poverty at the level of the district and above.

In September 1998, during the period the IHS was being administered, the decennial Malawi Population and Housing Census was carried out. Administered to all households in the nation, the census necessarily must be standardized, simple, and easy to administer. It is universal in coverage, but the information collected is limited.

Poverty mapping takes advantage of the poverty analysis and the wealth of detail in the household survey and the universal coverage of the census. A model of household welfare is developed using the household survey data within a regression analysis. The dependent variable is the natural log of the "household welfare indicator" - daily per capita consumption and expenditure of a household in Malawi Kwacha - developed in the poverty analysis of the IHS. The independent variables for the model are those household characteristic variables that are found in both the household survey and the census. Once a suitable model is developed using the household survey, that model is applied to the census data to generate a household welfare indicator for each household in the census. Having calculated the level of welfare of census households, poverty levels in villages and communities can then be determined.

METHOD

The methods used in the Malawi poverty mapping analysis using the IHS and the Malawi census were adapted from those developed in Elbers, Lanjouw, and Lanjouw, 2001. Briefly, the steps taken were as follows:

1. The household survey and census data sets were assembled. To ensure that the variables extracted from the survey equated with seemingly similar variables from the census, the two data sets were subjected to rigorous means comparison tests. The candidate household variables that remained following this testing are shown in the first table below.
2. Having done the comparisons and arrived at a final set of potential household variables, we then built models of household welfare from the IHS household survey data for each stratum.
 - Twenty-three separate models were developed, one for each of the 22 IHS analytical strata (made up of 11 single districts, 7 groupings of districts, and the 4 urban areas of Malawi), together with an additional stratum made up of census enumeration areas which, although found in rural areas, are essentially urban in character. This last stratum includes district *bomas* (administrative headquarters) and rural trading centers.
 - A stepwise regression analysis of the IHS data was used for each stratum to select those household variables that best explain variation in the logged household welfare indicator for the IHS households in the stratum. At the end of this step, we had a set of 23 models consisting wholly of household variables.
3. Enumeration area (EA) variables were then added to each model to improve their predictive power and to eliminate some econometric problems, such as spatial auto-correlation. A stepwise regression procedure was again used to select the EA variables most useful for explaining the variation in the household welfare indicator not explained by the previously selected household variables.
 - The EA variables are also shown in the first table below. They include some distance variables, such as the distance from the centerpoint of the EA to the nearest urban

center, developed using a Geographic Information System (GIS). Other EA variables are census means for the enumeration areas, such as the percentage of households in an EA with improved toilets, the general maximum education level in households in an EA, and so on.

4. An assessment was then made of the resultant models made up of both household and EA variables. Some initially selected household variables in the models were no longer significant with the addition of EA variables and could be dropped. Moreover, an evaluation of collinearity between the variables was done and, where collinearity was found, selected variables were eliminated from the models.
5. Having established the base model for use with the census data for each stratum, a secondary model was developed of the error in the base model.
 - In regression modeling, it is desirable that the error term or residual associated with each observation be independent of the level of the independent variables. Where there is such a relationship, the model is said to be heteroskedastic. To account for this undesirable pattern in our models of household welfare, the heteroskedasticity in each base model was modeled. To do this the residual from the base model for each IHS household was used as the dependent variable. The candidate independent variables for this secondary model were a large set consisting of the original household and enumeration area variables used in the base model, plus variables consisting of all interactions of these variables, and interactions of these variables with the predicted welfare indicator values from the base model and the square of the predicted welfare indicator.
 - The number of possible independent variables for this model can be extremely large. For example, if there were 20 variables in the base model, there would be a total of 230 candidate variables. Consequently, a stepwise regression procedure was again used to select from this set the independent variables for the secondary model.
6. The census data for each household in the nation was then used with the models to estimate the level of the household welfare indicator for each.
 - A computer program was developed by the World Bank to do this final step (Demombynes, 2001). Included in the input items for this program are the weighted-mean poverty line for Malawi and spatial identifier codes to assign each census household to a district, traditional authority (TA), and local government ward. The program used this information to calculate poverty measures for the households resident in each spatial unit across the county.
 - An important strength of this analytical method and the software program used is that it accounts for the error in the calculated poverty measures by employing an iterative, bootstrapping method in estimating the welfare level for households in the census. The standard errors generated can be used to assess whether differences in poverty measures between populations in different spatial units are statistically significant. (See Annex 3.)

THE MODELS

Basic descriptions of the resultant models are shown in the second table below. The following information is presented on each:

- The adjusted R-squared gives an indication of the predictive power of the base model, with values closer to 1.0 indicating better predictive ability. For the 23 models, this statistic ranges from 0.248 for the Dedza/Ntcheu model to 0.594 for Blantyre city. The mean adjusted R-squared is 0.380. The adjusted R-squared values for the models for the five urban stratum are somewhat higher (average of 0.470) than for the rural districts (0.355). Although the adjusted R-squared for poverty mapping models used in other countries have tended to be higher than these, the one country most comparable with Malawi in which poverty mapping has been done, Mozambique, has models with adjusted R-squared statistics at very similar levels. Across the 11 models used in Mozambique, the adjusted R-squared ranges from 0.26 to 0.55.
- The number of IHS households and sample clusters (EAs) used to compute the models is shown. The small number of clusters in certain strata necessarily limited the number of EA-level variables that could be employed in their models.
- The total number of census households in each stratum is shown. Note that these values are slightly less than the total numbers enumerated in the 1998 census, as

institutional "households" are not included in this analysis.

- Finally, the variables in each base model are presented. The actual coefficients and the statistical significance level of the coefficients are not presented here, but are available (Benson, Kanyanda, & Chinula, 2002).

In assessing the models using this information, one should recognize that we are dealing with a relatively small set of information in order to predict household welfare levels, being limited to those variables that exist in both the census and the survey. Variables on key correlates of the welfare level of households in a stratum may be missing from the IHS or census. For example, the IHS has no information on the quality of housing and the census has no data on landholding size, both of which have been shown elsewhere to be useful predictors of household welfare status in Malawi.

Secondly, one must be cautious in using these models to inform other poverty analysis. The models were developed for their predictive ability. Consequently, stepwise regression methods were used throughout. In the analysis, little attention was paid to which variables appear in the models and to the amplitude and sign of their coefficients, although in most models the variables selected and their coefficients do make economic sense.

RESULTS ASSESSMENTS

In the third table below, district-level poverty headcounts from the poverty mapping analysis are presented and compared with the poverty analysis of the 1997-98 IHS (NEC, 2000). (Only the incidence of poverty - the poverty headcount - is presented and examined here.) The poverty measures from the poverty mapping analysis were calculated by taking weighted averages of the local government ward-level poverty headcounts for a district. Overall, the headcounts from this poverty mapping analysis are comparable with those of the IHS analysis. Nationally, the headcount differs by one percent, with the poverty mapping analysis showing a slightly lower proportion of the population to be poor: 64.3 percent. At the regional level, the differences in headcount between the two analysis are between one and three percent. The ranking of the regions by poverty headcount for both the IHS and poverty mapping analysis are the same, although the headcount for the northern and southern regions are both lower with the poverty mapping analysis.

As might be expected, as one moves to the more local scale of the district, the differences between the IHS poverty analysis and that presented here are greater. Seven of the 31 districts and urban centres show statistically significant differences between the two estimates. For most of these seven, there was some concern with the quality of the information underlying the IHS analysis. For these districts - Nkhata Bay, Mzuzu city, Machinga, Mulanje, and Phalombe - the differences seen are not overly troubling. Likely the true level of poverty lies between the two estimates or even closer to that of the poverty mapping analysis. However, for the other two areas - Lilongwe rural and Blantyre rural - the differences are more troubling. Although the poverty headcounts in these two districts are not unreasonable, one would expect more convergence between the IHS results and those presented here as a greater number and a more dispersed set of survey households were used in the IHS in these areas than in most other strata.

The poverty measures resulting from the poverty mapping exercise are presented in the chapter on poverty in the atlas at two sub-district spatial scales - the traditional authority/urban administrative ward and the local government ward. It is at these scales and at even more local scales where the potential power of poverty mapping is most clearly seen. Although poverty incidence rates are relatively high in most areas, considerable differentiation exists within districts. The poverty mapping results for the traditional authority in urban administrative wards are presented in table form in Annex 3.

Even finer levels of analysis can be undertaken. Economists who have developed the poverty mapping methods argue that reliable estimates can be generated for groupings of 500 households or more. Unfortunately, the enumeration areas, which average 250 households in population are too small for reliable use. The local government ward used here serves as an intermediate spatial unit between the enumeration area and the traditional authority; however, as the average population of local government wards is 2,650 households, even smaller units could be used. Specially constructed agglomerations of EAs with populations just above the minimum population threshold of 500 households could be constructed and poverty measures for these units calculated. Such information might be of particular interest to district development planners in targeting their poverty reduction efforts.

ANNEX TABLE 2.1 - CANDIDATE VARIABLES USED IN DEVELOPING THE MODELS FOR MALAWI POVERTY MAPS

DEPENDENT VARIABLE			
LNWIADJ	natural log of spatially deflated household welfare indicator		
INDEPENDENT VARIABLES - HOUSEHOLD			
AGEHHH	age of head of household	HOURSNT	household rents house in which it lives
AGESQ	squared age of household head	KIDBORN	total children ever born to fertile women in household
BIKE	household owns a bicycle	KIDDEAD	proportion of kids born to fertile women in household now dead
BRTHRTE	years between births for women who have given birth in household	M0_05	number of males aged 0 to 5 in household
COOKEL	household cooks over electricity	M15_29	number of males aged 15 to 29 in household
COOKWD	household cooks over firewood	M30_49	number of males aged 30 to 49 in household
EMPLOYEE	head of household is an employee	M50UP	number of males aged 50 and up in household
EMPLYR	head of household is an employer	M6_14	number of males aged 6 to 14 in household
F0_05	number of females aged 0 to 5 in household	MMAXCL	maximum class attained by males
F15_29	number of females aged 15 to 29 in household	NETENRL	primary age children in primary school
F30_49	number of females aged 30 to 49 in household	NOMARRY	household head not married
F50UP	number of females aged 50 and up in household	NONFAM	members who are not of nuclear family
F6_14	number of females aged 6 to 14 in household	OTHROCC	household members with other occupation (services, artisans, etc.)
FAMBU	household has a family business	PRFNLIT	household gets lighting from paraffin
FEMALE	number of females in household	PRIMAGE	primary age child in household
FEMHHH	female headed household	PROF	household members with professional, admin, or clerical occupation
FINPRIM	total members finished primary	SALES	household members with sales occupation
FMAXCL	maximum class attained by females	SECIND	household members in secondary industry
FRTWMN	woman in household in fertile years (15 to 45)	SERVICE	household members with services occupation
HHHED	educational level of household head in years	TAPH2O	household acquires its water from a tap
HHSIZE	household size	TERIND	household members in tertiary industry
HHSZSQ	squared household size		
INDEPENDENT VARIABLES – ENUMERATION AREA			
AVGMXED	average maximum education level in households in EA	MARKET	straight-line distance (km) to nearest market centre
BOMA	straight-line distance (km) to nearest boma (district HQ)	MN_YLD	mean maize yield in EA over 20 years
DIFF	difference maize yield in EA in 1997 & 1998 from long term mean	POPDENS	population density (persons/sq. km.)
EAIMPTL	proportion of households in EA with improved toilets	ROAD	straight-line distance (km) to nearest primary or secondary road
EANTENR	net enrollment rate in EA	ROOMPC	avg. rooms per person in EA
EAPRMHS	proportion of households in EA with houses of permanent materials	URBAN	straight-line distance (km) to nearest urban centre
HELTHFA	straight-line distance (km) to nearest health facility		

ANNEX TABLE 2.2 - POVERTY MAPPING MODELS

MODEL STRATUM:	Chitipa	Karonga	Nkhata Bay	Mzimba-Rumphi	Kasungu	Nkhotakota	Ntchisi-Dowa	Salima	Lilongwe rural
Adj. R-Squared:	0.3602	0.3255	0.4407	0.4205	0.2658	0.4377	0.4325	0.3681	0.3506
IHS Households:	149	124	148	338	367	185	240	191	580
IHS clusters (EAs):	9	11	9	21	22	12	16	12	43
Census HHs:	23,451	31,924	31,091	112,424	87,556	42,310	117,546	51,792	201,537
Poverty headcount:	70.9%	53.5%	60.2%	65.8%	56.0%	73.1%	54.6%	52.4%	77.4%
Model variables:	BIKE F0_05 M6_14 F6_14 M15_29 NONFAM EMPLOYEE PRFNLIT ROAD AVGMXED HEALTHFA	PROF NOMARRY HHSIZE M15_29 BRTHRTE M30_49 BIKE	FEMHHH AVGMXED M0_05 F0_05 F6_14 M15_29 M30_49 FRTWMN BIKE EAPRMHS BRTHRTE M50UP TERIND KIDBORN MMAXCL FMAXCL FAMBU ROOMPC	FEMHHH AGEHHH M0_05 F0_05 F6_14 M15_29 M30_49 BIKE PROF HHHED SECIND HOUSRNT POPDENS EAPRMHS EAIMPTL MN_YLD EANTENR BOMA DIFF	FEMHHH AGEHHH M0_05 F0_05 M6_14 F6_14 FRTWMN BIKE TERIND HHHED FAMBU MN_YLD EAPRMHS EANTENR	AGEHHH M0_05 F0_05 M6_14 F6_14 M15_29 F15_29 HOUSRNT FINPRIM SERVICE BRTHRTE SALES EMPLOYEE BIKE MARKET AVGMXED ROAD	FMAXCL AGEHHH M0_05 BIKE M6_14 F6_14 M15_29 F15_29 FRTWMN FAMBU F50UP NONFAM FINPRIM ROOMPC EAIMPTL AVGMXED EANTENR HEALTHFA POPDENS DIFF	PRFNLIT HHSIZESQ COOKWD EMPLOYEE HOUSRNT F6_14 M15_29 NONFAM BIKE F15_29 EANTENR URBAN AVGMXED	AGEHHH M0_05 F0_05 M6_14 F6_14 M15_29 KIDBORN BRTHRTE F30_49 FRTWMN TAPH2O NOMARRY BIKE SECIND EMPLOYEE FAMBU HHHED PROF EAPRMHS POPDENS EANTENR DIFF ROAD

MODEL STRATUM:	Mchinji	Dedza-Ntcheu	Mangochi-Machinga-Balaka	Zomba Rural	Chiradzulu	Blantyre rural-Mwanza	Thyolo	Mulanje-Phalombe	Nsanje-Chikwawa
Adj. R-Squared:	0.3164	0.2482	0.4484	0.3749	0.2909	0.3201	0.3604	0.3388	0.2834
IHS Households:	293	436	657	252	324	249	268	424	213
IHS clusters (EAs):	19	25	48	17	22	22	19	30	20
Census HHs:	64,378	184,388	273,442	115,382	56,588	99,301	106,184	155,436	107,651
Poverty headcount:	64.4%	77.8%	72.5%	66.5%	69.6%	60.7%	72.6%	67.5%	53.9%
Model variables:	FEMHHH HHHED M0_05 F0_05 TAPH2O M15_29 F15_29 F30_49 EMPLOYEE FINPRIM ROOMPC EAPRMHS EAIMPTL URBAN	NOMARRY F50UP M0_05 F0_05 M6_14 F6_14 BIKE F15_29 F30_49 M15_29 ROOMPC ROAD AVGMXED BOMA	AGEHHH M0_05 F0_05 M6_14 F6_14 PROF BIKE FRTWMN SALES FINPRIM HHHED MARKET BOMA EAIMPTL AVGMXED	HHHED M0_05 F0_05 M6_14 F6_14 M15_29 PROF F50UP BIKE NONFAM PRFNLIT BOMA HEALTHFA AVGMXED EANTENR	AGEHHH M6_14 F6_14 M15_29 M30_49 FRTWMN F50UP MMAXCL TAPH2O EMPLYR BIKE POPDENS EAPRMHS URBAN EANTENR MARKET	FINPRIM SALES M0_05 F0_05 M6_14 F6_14 F50UP F50UP F15_29 FMAXCL F30_49 BIKE ROAD	FMAXCL M0_05 F6_14 F15_29 M6_14 M50UP TERIND HOUSRNT EMPLOYEE SECIND FMAXCL ROOMPC EAPRMHS POPDENS ROAD MARKET	FAMBU BIKE M0_05 F0_05 M6_14 F6_14 M15_29 SECIND FMAXCL FRTWMN HOUSRNT MN_YLD EANTENR	FINPRIM BIKE M0_05 M6_14 EMPLOYEE M15_29 F15_29 HEALTHFA EAPRMHS EANTENR AVGMXED

MODEL STRATUM:	Mzuzu city	Lilongwe city	Zomba munic.	Blantyre city	Urban areas in rural zones
Adj. R-Squared:	0.3782	0.5095	0.5468	0.5621	0.3525
IHS Households:	119	228	164	413	199
IHS clusters (EAs):	20	35	24	59	15
Census HHs:	18,395	97,075	14,664	119,093	137,292
Poverty headcount:	63.5%	44.1%	70.1%	62.9%	41.9%
Model variables:	BIKE PRFNLIT M6_14 NOMARRY M15_29 F15_29 FMAXCL F30_49 HHHED TAPH2O POPDENS	FMAXCL F0_05 M15_29 HOUSRNT FRTWMN F30_49 M50UP PRFNLIT NONFAM NETENRL HHHED ROOMPC EANTENR AVGMXED	HHHED MMAXCL M0_05 F0_05 M6_14 F50UP FMAXCL F15_29 TERIND F30_49 PRFNLIT EAPRMHS	FINPRIM M0_05 FRTWMN M6_14 M15_29 PRFNLIT PRIMAGE F30_49 F50UP FEMALE HHHED PROF EMPLOYEE EAIMPTL	COOKWD AGEHHH F0_05 M6_14 FRTWMN F30_49 PRFNLIT BRTHRTE MMAXCL COOKEL SALES BIKE URBAN

ANNEX TABLE 2.3 - COMPARISON OF POVERTY MAPPING RESULTS TO IHS POVERTY ANALYSIS RESULTS

	Poverty mapping poverty headcount		IHS poverty headcount		Difference between estimates (PovMap – IHS)	Poverty mapping standard error of estimate	Is difference statistically significant?
	percent	district rank	percent	district rank			
MALAWI	64.3		65.3		-1.0	3.73	-
Northern region	61.1		62.5		-1.4	4.1	-
Chitipa	66.6	7	71.3	7	-4.7	4.55	-
Karonga	48.5	1	42.1	1	6.4	6.21	-
Nkhata-Bay	60.2	3	47.7	2	12.5	3.99	yes
Rumphi	66.6	6	65.8	4	0.8	4.21	-
Mzimba	63.2	4	67.5	5	-4.3	3.22	-
Mzuzu City	63.5	5	70.9	6	-7.4	3.48	yes
Likoma	52.5	2	47.7	2	4.8	6.66	-
Central region	63.9		62.8		1.1	4.0	-
Kasungu	54.0	4	48.9	2	5.1	3.49	-
Nkhotakota	68.0	7	65.3	5	2.7	4.36	-
Ntchisi	64.8	6	76.3	9	-11.5	7.00	-
Dowa	49.8	2	53.6	3	-3.8	4.21	-
Salima	50.9	3	60.8	4	-9.9	5.58	-
Lilongwe Rural	76.7	9	65.6	6	11.1	4.43	yes
Lilongwe City	44.1	1	37.9	1	6.2	3.18	-
Mchinji	62.4	5	68.0	7	-5.6	3.99	-
Dedza	72.8	8	73.3	8	-0.5	2.72	-
Ntcheu	79.6	10	84.0	10	-4.4	3.22	-
Southern region	65.4		68.1		-2.7	3.4	-
Mangochi	69.6	10	69.8	8	-0.2	2.67	-
Machinga	71.4	12	63.5	4	7.9	3.05	yes
Zomba Rural	66.1	6	71.9	10	-5.8	4.52	-
Zomba Munic.	70.1	11	78.0	13	-7.9	4.27	-
Chiradzulu	69.1	9	74.0	11	-4.9	2.64	-
Blantyre Rural	55.3	3	65.3	6	-10.0	2.47	yes
Blantyre City	62.9	5	60.5	3	2.4	2.45	-
Mwanza	69.1	8	71.4	9	-2.3	3.19	-
Thyolo	71.5	13	76.8	12	-5.3	6.44	-
Mulanje	60.3	4	67.2	7	-6.9	3.12	yes
Phalombe	78.1	14	83.9	14	-5.8	2.00	yes
Chikwawa	54.9	2	54.8	2	0.1	3.06	-
Nsanje	49.5	1	51.3	1	-1.8	4.04	-
Balaka	68.7	7	63.5	4	5.2	3.77	-
Rural	65.3		66.5		-1.2	3.83	-
Urban	55.8		54.9		0.9	2.93	-

POVERTY MEASURES FOR TRADITIONAL AUTHORITIES AND URBAN ADMINISTRATIVE WARDS

(S.E. - STANDARD ERROR OF THE MEASURE). ONLY THOSE TRADITIONAL AUTHORITIES AND URBAN ADMINISTRATIVE WARDS WITH A POPULATION OF MORE THAN 500 HOUSEHOLDS APPEAR IN THIS TABLE.

Area Name	Poverty headcount		Ultrapoverty headcount		Depth of poverty		Severity of poverty	
	value	s.e.	value	s.e.	value	s.e.	value	s.e.
MALAWI	64.3	5.1	36.3	5.4	0.282	0.037	0.157	0.027
<i>Northern Region</i>	61.1	5.5	31.9	5.1	0.252	0.035	0.134	0.024
Chitipa District	66.6	4.5	31.6	4.8	0.257	0.031	0.132	0.022
TA Mwabulamba	72.8	2.6	34.0	3.6	0.278	0.022	0.140	0.016
TA Mwenemisuku	63.1	9.6	26.1	8.4	0.226	0.057	0.114	0.038
TA Mwenwenya	72.5	3.4	39.9	4.0	0.306	0.025	0.163	0.019
TA Nthallire	66.2	5.9	34.7	6.2	0.274	0.041	0.146	0.029
TA Kameme	71.2	5.7	33.3	6.9	0.273	0.043	0.138	0.030
Chitipa Boma	15.1	10.2	5.0	4.6	0.047	0.038	0.021	0.019
Karonga District	48.5	6.2	21.6	5.5	0.181	0.038	0.092	0.025
TA Kilupula	51.0	6.0	22.0	5.7	0.187	0.038	0.093	0.026
SC Mwakaboko	44.7	7.1	17.9	5.6	0.157	0.039	0.076	0.025
TA Kyungu	52.7	5.6	23.5	5.5	0.198	0.037	0.101	0.026
TA Wasambo	56.2	6.2	27.7	6.4	0.224	0.043	0.118	0.031
SC Mwirang'ombe	53.4	6.1	24.3	6.1	0.203	0.041	0.104	0.028
Karonga Town	25.7	10.1	9.4	5.3	0.085	0.042	0.040	0.022
Nkhata Bay District	60.2	4.0	30.9	3.8	0.245	0.025	0.129	0.017
TA Kabunduli	59.3	3.2	29.5	3.1	0.236	0.020	0.122	0.014
TA Fukamapiri	63.0	3.4	33.4	3.4	0.261	0.022	0.139	0.016
TA Malenga Mzoma	61.1	5.0	32.0	4.6	0.251	0.030	0.133	0.021
SC Malanda	57.8	5.7	29.2	4.9	0.233	0.033	0.123	0.022
SC Zilakoma	57.2	3.5	30.3	3.3	0.238	0.021	0.127	0.015
TA Mankhambira	65.7	4.1	37.0	4.9	0.281	0.031	0.151	0.023
SC Fukamalaza	65.3	4.0	34.9	4.2	0.273	0.027	0.146	0.019
SC Mkumbira	59.2	5.4	29.7	5.3	0.235	0.035	0.121	0.024
TA Musisya	64.5	6.7	33.5	6.7	0.266	0.045	0.142	0.032
SC Nyaluwanga	50.0	5.9	22.2	4.5	0.187	0.032	0.095	0.021
TA Timbiri	60.1	3.5	30.2	3.3	0.240	0.021	0.124	0.015
Nkhata Bay Boma	52.0	8.4	26.2	7.2	0.210	0.050	0.112	0.033
Rumphi District	66.6	4.2	40.3	5.0	0.306	0.034	0.175	0.027
TA Chikulamayembe	72.6	6.2	44.7	7.5	0.335	0.050	0.190	0.037
TA Mwamlowe	72.2	4.8	53.5	5.3	0.395	0.041	0.253	0.040
SC Mwahenga	72.7	6.1	43.4	6.9	0.325	0.045	0.180	0.031
SC MwaWeni	53.4	9.0	25.8	6.5	0.211	0.048	0.110	0.031
SC Kachulu	57.4	7.5	26.1	5.2	0.216	0.037	0.108	0.022
SC Mwankhunikira	71.4	5.5	46.1	6.7	0.347	0.050	0.207	0.042
TA Katumbi	76.3	6.3	53.4	8.9	0.385	0.059	0.230	0.048
TA Zolokere	92.5	5.0	76.2	11.1	0.544	0.082	0.358	0.078
Rumphi Boma	43.4	6.8	19.0	4.9	0.160	0.035	0.079	0.021
Mzimba District	63.2	3.2	34.0	2.5	0.266	0.017	0.142	0.012
TA M'Mbelwa	45.2	8.4	19.9	5.1	0.167	0.038	0.083	0.021
TA Mtwalo	66.1	4.3	37.2	4.2	0.286	0.029	0.156	0.020
SC Kapingo Sibande	54.9	5.9	26.4	4.5	0.214	0.033	0.110	0.021
SC Jaravikuba Munthall	61.1	6.6	31.1	6.1	0.246	0.041	0.128	0.027
TA Chindi	75.6	2.7	42.5	3.4	0.327	0.021	0.178	0.016
TA Mzikubola	53.4	7.0	25.1	5.6	0.206	0.040	0.105	0.026
TA Mabulabo	71.5	4.5	40.1	5.2	0.308	0.034	0.167	0.024
SC Khosolo Gwaza Jere	79.5	5.0	47.4	6.6	0.357	0.042	0.198	0.031
TA Mpherembe	75.3	4.2	46.9	5.6	0.349	0.037	0.197	0.028
TA Mzukuzuku	62.4	3.9	33.7	3.5	0.264	0.023	0.143	0.017
Mzimba Boma	36.9	7.1	15.3	4.6	0.131	0.033	0.064	0.019
Mzuzu City	63.5	3.5	33.0	2.9	0.261	0.019	0.137	0.014
Lupaso Ward	76.9	3.2	48.1	4.6	0.358	0.030	0.204	0.025
Zolozolo Ward	58.1	4.4	26.8	3.3	0.220	0.022	0.110	0.013
Chiputula Ward	56.4	6.0	25.8	4.1	0.212	0.028	0.105	0.016
Chibanja Ward	60.0	4.2	28.6	3.3	0.233	0.022	0.118	0.014
Mchengautuwa Ward	61.3	4.9	29.6	3.9	0.239	0.026	0.121	0.016
Katoto Ward	62.5	4.8	31.7	4.9	0.252	0.031	0.131	0.021
Muzilawayingwe Ward	61.9	4.7	29.1	4.2	0.237	0.026	0.119	0.017
Katawa Ward	43.2	5.2	16.9	3.0	0.148	0.021	0.070	0.012
Kaning'ina Ward	57.0	6.6	23.3	6.1	0.202	0.039	0.096	0.025
Vlphya Ward	72.7	3.5	41.1	3.6	0.314	0.022	0.170	0.016
New Airport Site	84.7	4.1	57.8	5.9	0.421	0.040	0.249	0.034
Likoma District	52.5	6.7	22.6	5.0	0.192	0.035	0.094	0.022
TA Mkumpha	52.5	6.7	22.6	5.0	0.192	0.035	0.094	0.022
<i>Central Region</i>	63.9	5.5	36.5	5.8	0.283	0.039	0.160	0.029
Kasungu District	54.0	3.5	23.1	3.3	0.195	0.021	0.094	0.013
TA Kaluluma	42.4	2.9	14.9	2.0	0.137	0.013	0.062	0.008
SC Simlemba	43.3	3.6	13.6	2.3	0.132	0.016	0.057	0.009
SC M'nyanja	42.2	2.3	14.0	1.7	0.133	0.011	0.059	0.007
SC Chisikwa	51.9	5.5	18.2	3.8	0.168	0.025	0.074	0.014
TA Kaomba	52.6	3.3	22.7	2.5	0.192	0.017	0.094	0.011
SC Lukwa	59.7	3.5	26.1	3.6	0.219	0.022	0.106	0.014
SC Kawamba	66.1	5.3	31.5	5.6	0.255	0.035	0.127	0.023
SC Njombwa	59.6	4.6	27.5	4.5	0.225	0.029	0.111	0.019
SC Chilowamatambe	58.9	3.8	25.6	3.4	0.215	0.022	0.104	0.014
TA Chulu	37.5	3.1	11.6	2.0	0.114	0.014	0.050	0.008
TA Santhe	60.8	5.4	27.5	4.8	0.227	0.031	0.111	0.019
TA Wimbe	62.8	4.7	29.5	4.9	0.240	0.031	0.118	0.020

POVERTY MEASURES FOR TRADITIONAL AUTHORITIES AND URBAN ADMINISTRATIVE WARDS (CONTINUED)

Area Name	Poverty headcount		Ultrapoverty headcount		Depth of poverty		Severity of poverty	
	value	s.e.	value	s.e.	value	s.e.	value	s.e.
TA Kapelula	65.6	6.9	30.7	6.9	0.249	0.044	0.123	0.028
TA Mwase	55.6	3.7	23.0	3.4	0.197	0.021	0.093	0.013
Kasungu Boma	27.8	6.8	9.9	3.5	0.091	0.027	0.042	0.015
Nkhotakota District	68.0	4.4	36.3	5.0	0.278	0.032	0.142	0.022
TA Kanyenda	63.1	6.3	33.5	6.3	0.257	0.041	0.132	0.027
SC Kafuzila	79.0	5.1	51.7	7.9	0.371	0.050	0.207	0.039
TA Malenga Chanzi	66.3	2.6	28.8	2.5	0.240	0.015	0.113	0.010
SC Mphonde	71.4	3.2	32.7	3.9	0.266	0.022	0.126	0.014
TA Mwadzama	82.9	3.2	49.2	5.7	0.359	0.033	0.186	0.025
SC Mwansambo	78.3	13.3	49.6	19.9	0.364	0.124	0.205	0.094
Nkhotakota Boma	36.4	9.4	15.6	6.1	0.133	0.045	0.067	0.027
Ntchisi District	64.8	7.0	41.1	6.4	0.316	0.048	0.193	0.036
TA Kasakula	90.0	4.1	73.9	7.9	0.549	0.067	0.377	0.067
TA Chikho	93.2	3.6	78.7	8.7	0.584	0.077	0.407	0.083
TA Kalumo	74.1	7.3	48.3	7.7	0.366	0.054	0.222	0.041
SC Nthondo	50.0	10.0	22.3	6.7	0.188	0.049	0.095	0.028
SC Chilooko	45.1	9.5	20.7	6.1	0.172	0.045	0.088	0.026
Ntchisi Boma	39.4	7.4	16.5	4.9	0.142	0.036	0.069	0.021
Dowa District	49.8	4.2	26.2	4.1	0.210	0.029	0.117	0.022
TA Dzoole	40.9	4.9	17.6	3.4	0.149	0.024	0.074	0.015
SC Chakhaza	42.5	6.3	17.7	3.9	0.152	0.029	0.075	0.017
SC Kayembe	23.8	4.5	8.4	2.4	0.077	0.018	0.036	0.010
TA Chiwere	71.8	6.8	46.1	8.6	0.353	0.062	0.216	0.053
SC Mkukula	61.6	7.2	35.6	8.1	0.277	0.056	0.159	0.042
TA Msakambewa	64.6	4.5	39.5	5.6	0.308	0.041	0.186	0.037
SC Mponela	56.0	6.5	28.9	5.9	0.231	0.041	0.125	0.028
Dowa Boma	45.9	8.3	21.5	6.8	0.177	0.046	0.092	0.029
Mponela Urban	45.4	6.4	21.2	4.9	0.175	0.035	0.091	0.022
Salima District	50.9	5.6	23.5	4.1	0.194	0.029	0.099	0.018
TA Maganga	58.9	7.2	30.7	6.9	0.243	0.046	0.130	0.031
TA Karonga	61.2	2.9	29.3	2.7	0.239	0.018	0.123	0.013
TA Pemba	37.4	12.5	15.5	8.1	0.133	0.059	0.066	0.034
SC Kambwiri	48.0	5.0	20.6	3.9	0.176	0.027	0.088	0.018
TA Ndindi	48.7	6.5	22.5	4.2	0.185	0.030	0.094	0.017
SC Kambalame	51.1	10.5	22.4	7.6	0.187	0.054	0.092	0.032
TA Khombedza	50.6	6.0	21.9	4.5	0.185	0.031	0.091	0.019
SC Mwanza	42.7	7.1	17.7	5.3	0.153	0.037	0.075	0.022
TA Kuluunda	59.2	10.4	30.2	8.8	0.243	0.061	0.131	0.040
SC Msosa	47.7	12.7	20.3	8.7	0.173	0.062	0.086	0.037
Salima Town	36.1	6.0	15.4	3.9	0.131	0.028	0.065	0.016
Chipoka Urban	43.5	10.1	20.2	7.4	0.167	0.053	0.086	0.033
Lilongwe Rural	76.7	4.4	48.8	5.1	0.366	0.035	0.214	0.028
TA Chadza	80.6	4.9	52.7	7.6	0.391	0.050	0.229	0.041
TA Kalolo	69.1	9.1	39.7	8.9	0.303	0.060	0.167	0.041
TA Chiseka	66.3	10.5	39.8	8.5	0.304	0.059	0.175	0.039
TA Mazengera	82.8	4.4	56.6	7.5	0.419	0.052	0.254	0.044
SC Chitekwele	75.0	7.1	42.0	9.3	0.321	0.058	0.172	0.042
TA Khongoni	75.9	5.6	45.1	7.3	0.342	0.047	0.191	0.035
TA Chimutu	87.9	5.3	64.8	9.8	0.475	0.069	0.301	0.062
TA Chitukula	83.9	5.2	54.7	8.2	0.401	0.052	0.231	0.040
SC Mtema	82.9	4.9	53.4	7.0	0.395	0.045	0.228	0.035
TA Kalumbu	89.0	3.4	66.9	7.6	0.491	0.058	0.314	0.056
SC Tsabango	87.1	3.8	63.3	7.6	0.476	0.058	0.310	0.057
TA Kalumba	76.7	9.9	50.1	13.4	0.376	0.092	0.225	0.073
SC Njewa	75.3	7.4	47.1	9.8	0.354	0.065	0.205	0.050
TA Mailli	74.2	8.1	44.0	10.0	0.334	0.066	0.187	0.048
TA Kabudula	80.3	5.1	50.0	7.7	0.373	0.049	0.212	0.038
Lilongwe City	44.1	3.2	19.9	2.7	0.166	0.018	0.084	0.012
Area 1	43.5	4.3	18.5	3.8	0.157	0.025	0.076	0.016
Area 2	14.7	3.9	5.8	2.4	0.050	0.017	0.024	0.010
Area 3	17.4	3.2	5.3	1.8	0.052	0.013	0.022	0.007
Area 7	46.2	3.3	21.2	2.7	0.175	0.019	0.088	0.012
Area 8	44.7	4.2	19.7	3.4	0.164	0.023	0.081	0.015
Area 10	20.6	2.6	8.9	1.9	0.075	0.012	0.038	0.008
Area 12	17.3	4.4	5.5	2.1	0.053	0.016	0.023	0.008
Area 18	30.3	5.0	10.7	3.1	0.098	0.023	0.045	0.013
Area 21	42.5	3.5	17.3	2.7	0.150	0.018	0.073	0.011
Area 22	53.6	3.8	27.1	3.7	0.217	0.025	0.116	0.018
Area 23	43.5	3.7	18.3	2.9	0.156	0.020	0.076	0.013
Area 24	46.0	5.1	20.4	4.0	0.171	0.028	0.085	0.017
Area 25	42.7	3.2	18.6	2.6	0.157	0.018	0.078	0.012
Area 26	51.6	8.0	29.4	7.1	0.232	0.052	0.136	0.038
Area 35	44.5	8.6	16.7	7.1	0.150	0.048	0.069	0.030
Area 36	51.2	5.3	23.0	4.5	0.192	0.031	0.096	0.020
Area 38	32.5	7.4	13.9	5.0	0.118	0.036	0.058	0.022
Area 39	57.5	6.9	29.9	6.7	0.234	0.044	0.122	0.029
Area 44	55.0	5.1	28.1	4.7	0.226	0.032	0.121	0.023
Area 47	13.6	3.1	4.4	1.4	0.042	0.011	0.019	0.006
Area 49	30.2	3.4	12.7	2.4	0.109	0.017	0.054	0.010
Area 50	62.8	5.1	34.2	5.6	0.267	0.037	0.144	0.027
Area 51	50.2	6.1	20.9	4.8	0.181	0.033	0.088	0.021
Area 52	51.3	7.1	29.6	6.4	0.230	0.047	0.132	0.033

POVERTY MEASURES FOR TRADITIONAL AUTHORITIES AND URBAN ADMINISTRATIVE WARDS (CONTINUED)

Area Name	Poverty headcount		Ultrapoverty headcount		Depth of poverty		Severity of poverty	
	value	s.e.	value	s.e.	value	s.e.	value	s.e.
Area 53	37.6	3.2	16.6	2.4	0.139	0.016	0.070	0.011
Area 54	52.8	8.1	26.9	7.6	0.213	0.051	0.112	0.034
Area 55	50.2	6.7	25.9	6.0	0.206	0.042	0.111	0.028
Area 56	52.7	5.2	24.4	4.4	0.201	0.030	0.102	0.019
Area 57	46.4	5.0	20.2	3.7	0.171	0.027	0.086	0.017
Area 58	42.5	4.1	20.0	3.2	0.165	0.023	0.086	0.015
Mchinji District	62.4	4.0	32.7	3.7	0.257	0.025	0.136	0.016
TA Mlonyeni	64.9	7.0	33.9	7.0	0.266	0.046	0.140	0.030
SC Mawwere	67.8	7.9	37.3	8.1	0.288	0.054	0.155	0.036
TA Zulu	64.0	4.4	33.8	4.2	0.264	0.028	0.140	0.018
SC Mduwa	67.3	4.2	36.3	4.4	0.282	0.029	0.151	0.020
TA Mkanda	54.0	10.9	25.9	9.1	0.210	0.063	0.108	0.039
SC Dambe	62.7	4.0	33.1	4.1	0.260	0.027	0.138	0.019
Mchinji Boma	33.3	6.9	13.2	4.3	0.115	0.032	0.055	0.018
Dedza District	72.8	2.7	44.2	3.6	0.337	0.025	0.195	0.021
TA Pemba	71.7	2.5	42.0	3.3	0.322	0.022	0.182	0.018
SC Chillikumwendo	72.5	3.0	38.1	3.5	0.297	0.022	0.154	0.016
TA Kaphuka	66.2	3.2	35.7	3.2	0.280	0.022	0.152	0.016
TA Tambala	82.8	4.9	60.7	8.5	0.450	0.062	0.287	0.056
SC Chauma	80.0	4.1	49.0	6.1	0.365	0.038	0.204	0.029
TA Kasumbu	79.3	5.4	55.9	7.7	0.420	0.054	0.266	0.045
TA Kachindamoto	74.6	3.6	42.4	4.5	0.323	0.028	0.174	0.020
SC Kamenya Gwaza	80.4	5.1	57.5	6.5	0.430	0.046	0.274	0.039
Dedza Boma	41.8	6.6	19.1	4.8	0.158	0.034	0.081	0.021
Ntcheu District	79.6	3.2	55.0	4.1	0.412	0.030	0.257	0.027
TA Phambala	84.8	3.2	63.1	5.3	0.465	0.040	0.298	0.037
TA Mpando	89.8	3.0	77.7	5.6	0.599	0.059	0.442	0.067
TA Kwataine	76.6	5.9	53.6	6.5	0.406	0.046	0.260	0.040
SC Makwangwala	78.6	4.2	52.1	5.2	0.389	0.036	0.234	0.030
SC Champiti	82.1	4.3	58.6	5.5	0.437	0.040	0.277	0.036
TA Njolomole	77.9	4.4	52.8	5.3	0.395	0.038	0.242	0.033
TA Chakhumbira	78.3	3.7	48.0	4.6	0.358	0.029	0.200	0.022
SC Goodson Ganya	77.7	2.7	48.2	3.6	0.360	0.024	0.205	0.019
TA Masasa	87.8	2.3	60.1	4.6	0.434	0.029	0.253	0.025
Ntcheu Boma	32.4	7.0	12.8	4.3	0.113	0.032	0.055	0.019
<i>Southern Region</i>	<i>65.4</i>	<i>4.7</i>	<i>37.1</i>	<i>5.1</i>	<i>0.288</i>	<i>0.035</i>	<i>0.161</i>	<i>0.025</i>
Mangochi District	69.6	2.7	40.2	2.9	0.307	0.019	0.170	0.014
TA Mponda	71.8	3.0	43.8	3.5	0.331	0.023	0.189	0.018
TA Chimwala	71.6	3.3	40.9	3.7	0.313	0.024	0.171	0.017
TA Nankumba	58.5	4.5	25.6	3.7	0.214	0.025	0.104	0.015
TA Jalasi	78.2	3.9	51.5	5.3	0.380	0.035	0.223	0.027
SC Mbwana Nyambi	77.2	3.0	46.2	4.0	0.348	0.026	0.193	0.019
SC Chowe	79.0	3.1	51.0	4.0	0.379	0.027	0.221	0.020
TA Katuli	74.0	3.5	43.9	4.4	0.332	0.029	0.185	0.021
TA Makanjila	63.8	7.1	31.4	7.0	0.251	0.046	0.128	0.030
SC Namabvi	71.6	4.7	39.6	5.6	0.305	0.036	0.163	0.025
Mangochi Town	37.3	6.6	16.2	4.4	0.137	0.032	0.068	0.019
Monkey Bay Urban	31.8	8.3	13.0	5.1	0.113	0.038	0.055	0.022
Machinga District	71.4	3.0	40.2	3.4	0.308	0.022	0.167	0.016
TA Liwonde	73.7	3.7	42.8	4.2	0.325	0.028	0.179	0.020
SC Sitola	76.2	4.6	47.2	5.9	0.355	0.038	0.204	0.029
TA Kawinga	72.8	4.0	40.5	4.8	0.311	0.031	0.167	0.022
SC Chamba	73.2	4.3	44.0	4.7	0.333	0.031	0.188	0.022
SC Mposa	71.2	3.7	39.8	4.2	0.306	0.027	0.166	0.019
SC Mlomba	75.0	3.8	44.0	4.4	0.333	0.029	0.184	0.021
SC Chikweo	66.7	6.0	33.2	6.0	0.264	0.039	0.135	0.026
SC Ngokwe	62.7	6.9	28.8	6.6	0.237	0.043	0.117	0.027
SC Chiwalo	74.3	6.1	42.9	7.1	0.326	0.045	0.177	0.031
TA Nyambi	75.7	3.7	43.8	4.6	0.333	0.030	0.183	0.021
Liwonde Town	47.9	6.3	24.6	5.2	0.197	0.037	0.107	0.024
Zomba Rural	66.1	4.5	39.6	5.8	0.307	0.041	0.181	0.035
TA Kuntumanji	64.8	5.0	36.9	5.7	0.287	0.040	0.163	0.031
TA Mwambo	70.4	6.2	47.0	8.4	0.359	0.062	0.224	0.053
SC Mkumbira	80.9	22.7	68.5	28.3	0.568	0.251	0.451	0.246
TA Chikowi	56.8	6.2	27.7	4.7	0.225	0.033	0.117	0.021
SC Mbiza	70.7	6.3	43.9	8.3	0.335	0.057	0.198	0.045
TA Mlumba	66.3	4.6	39.5	5.2	0.308	0.037	0.182	0.031
TA Malemia	55.5	7.9	26.3	6.0	0.216	0.042	0.111	0.026
Zomba Municipality	70.1	4.3	42.4	4.1	0.322	0.027	0.184	0.019
Mbedza Ward	75.2	6.7	48.4	8.2	0.363	0.053	0.215	0.040
Mtiya Ward	61.7	7.6	34.1	6.6	0.266	0.045	0.147	0.030
Chikamveka Ward	45.6	9.7	20.4	7.4	0.172	0.052	0.088	0.032
Chikamveka North Ward	82.1	3.5	55.0	5.2	0.406	0.034	0.241	0.027
Chirunga East Ward	74.0	5.6	47.5	6.9	0.357	0.045	0.210	0.035
Likangala Ward	81.8	4.4	52.9	6.1	0.391	0.039	0.226	0.030
Zakazaka Ward	60.2	11.3	29.8	10.4	0.239	0.071	0.124	0.046
Chambo Ward	58.2	8.1	30.1	6.5	0.237	0.044	0.124	0.028
Sadzi Ward	74.3	4.7	44.3	6.0	0.337	0.038	0.190	0.028
Likangala Central Ward	81.3	4.4	55.0	5.7	0.406	0.038	0.243	0.031

POVERTY MEASURES FOR TRADITIONAL AUTHORITIES AND URBAN ADMINISTRATIVE WARDS (CONTINUED)

Area Name	Poverty headcount		Ultrapoverty headcount		Depth of poverty		Severity of poverty	
	value	s.e.	value	s.e.	value	s.e.	value	s.e.
Chiradzulu District	69.1	2.6	38.3	2.9	0.297	0.019	0.162	0.013
TA Mpama	70.6	3.3	40.3	3.8	0.311	0.025	0.173	0.018
TA Likoswe	68.3	3.6	36.8	3.9	0.289	0.025	0.157	0.018
TA Kadewere	69.0	3.3	37.2	3.4	0.290	0.022	0.156	0.015
TA Nkalo	69.8	3.5	40.8	4.2	0.311	0.028	0.174	0.020
TA Chitera	69.6	3.4	37.2	4.1	0.290	0.026	0.154	0.019
TA Nchemba	69.1	2.9	38.9	3.2	0.299	0.021	0.164	0.016
Chiradzulu Boma	46.8	10.4	22.9	7.9	0.185	0.056	0.097	0.035
Blantyre Rural	55.3	2.5	22.7	2.4	0.198	0.015	0.097	0.010
TA Kapeni	46.0	3.4	17.3	2.3	0.157	0.017	0.076	0.010
TA Lundu	55.9	3.4	22.1	2.9	0.195	0.019	0.093	0.012
TA Chigaru	52.3	2.9	19.2	2.2	0.176	0.014	0.082	0.009
TA Kunthembwe	77.1	6.3	41.8	9.4	0.328	0.057	0.177	0.041
TA Makata	58.0	2.9	22.0	2.6	0.198	0.016	0.092	0.010
TA Kuntaja	58.4	3.6	25.1	3.5	0.215	0.023	0.107	0.015
TA Machinjill	50.1	2.8	18.1	2.2	0.167	0.015	0.078	0.009
TA Somba	56.6	2.9	22.3	2.6	0.198	0.017	0.095	0.011
Blantyre City	62.9	2.4	38.4	2.9	0.290	0.020	0.167	0.015
Michiru Ward	72.9	3.9	46.2	4.8	0.345	0.032	0.200	0.025
South Lunzu Ward	73.4	4.6	46.4	5.4	0.349	0.037	0.204	0.028
Mapanga Ward	74.1	5.3	45.4	6.6	0.341	0.043	0.194	0.032
Nkolokoti Ward	78.6	4.4	51.8	6.0	0.384	0.041	0.227	0.032
Ndirande North Ward	74.3	4.8	47.0	6.5	0.352	0.043	0.205	0.034
Ndirande South Ward	65.6	3.3	39.3	3.8	0.298	0.026	0.170	0.020
Ndirande West Ward	51.0	4.0	28.9	4.2	0.224	0.028	0.125	0.020
Nyambadwe Ward	43.9	6.6	24.9	7.3	0.192	0.048	0.107	0.036
Likhubula Ward	71.2	4.2	44.7	5.4	0.335	0.036	0.194	0.028
Chilomoni Ward	53.1	5.4	28.9	4.8	0.226	0.033	0.124	0.023
Blantyre West Ward	59.5	3.8	36.5	4.8	0.276	0.033	0.159	0.026
Blantyre Central Ward	19.1	5.4	7.3	3.1	0.064	0.023	0.030	0.013
Chichiri Ward	23.9	6.7	9.5	3.9	0.082	0.029	0.039	0.016
Mzedi Ward	78.5	4.6	52.6	6.2	0.389	0.041	0.233	0.033
Bangwe Ward	70.6	5.1	43.9	6.1	0.331	0.042	0.192	0.032
Namiyango Ward	73.6	4.9	47.0	6.3	0.352	0.042	0.206	0.033
Limbe East Ward	55.1	3.5	32.2	3.6	0.246	0.025	0.138	0.018
Limbe Central Ward	17.6	9.6	6.2	4.7	0.057	0.037	0.026	0.020
Limbe West Ward	19.6	5.2	7.4	2.8	0.066	0.022	0.031	0.012
Soche East Ward	15.4	4.4	5.3	2.0	0.049	0.017	0.022	0.009
Soche West Ward	44.1	3.6	22.4	3.0	0.179	0.021	0.095	0.014
Nancholi Ward	75.4	5.8	48.0	7.3	0.358	0.048	0.207	0.036
Misesa Ward	79.4	4.1	52.1	5.6	0.386	0.038	0.227	0.030
Chigumula Ward	75.2	4.4	50.1	5.7	0.373	0.039	0.224	0.031
Msamba Ward	81.3	10.1	54.6	14.4	0.404	0.098	0.242	0.079
Mwanza District	69.1	3.2	38.1	5.6	0.299	0.035	0.165	0.029
TA Dambe	87.1	4.5	63.8	10.9	0.464	0.076	0.289	0.071
TA Mlauli	69.0	3.3	32.8	4.3	0.269	0.025	0.137	0.017
TA Kanduku	66.7	2.7	34.0	4.4	0.273	0.026	0.146	0.020
TA Nthache	74.8	3.5	42.5	6.7	0.329	0.041	0.182	0.034
TA Symon	52.8	3.0	19.5	2.2	0.178	0.015	0.083	0.009
TA Ngozi	82.7	6.3	52.9	11.6	0.392	0.070	0.225	0.056
Mwanza Boma	40.3	6.4	18.8	5.0	0.155	0.035	0.080	0.022
Thyolo District	71.5	6.4	43.9	6.2	0.331	0.041	0.190	0.028
TA Nsabwe	87.1	7.4	62.6	13.1	0.452	0.088	0.275	0.075
SC Thukuta	87.8	5.9	62.0	10.9	0.445	0.071	0.264	0.059
SC Mbawela	90.7	3.2	68.8	7.0	0.492	0.049	0.307	0.044
TA Changata	76.1	7.2	47.3	8.7	0.354	0.057	0.203	0.043
SC Mphuka	83.5	4.7	57.2	7.9	0.417	0.054	0.248	0.045
SC Kwethemule	74.8	4.6	45.6	5.2	0.343	0.034	0.195	0.025
TA Kapichi	79.2	4.4	50.6	5.9	0.377	0.039	0.219	0.030
TA Nchilamwela	61.2	8.8	32.3	8.7	0.256	0.059	0.139	0.041
TA Chimaliro	63.3	14.2	35.4	14.0	0.276	0.096	0.154	0.066
TA Bvumbwe	60.9	12.8	31.6	12.0	0.252	0.082	0.135	0.055
TA Thomas	76.7	7.8	46.7	10.4	0.348	0.066	0.194	0.048
Thyolo Boma	39.2	8.8	17.4	6.1	0.146	0.044	0.074	0.027
Luchenza Town	47.1	6.7	23.8	5.5	0.192	0.039	0.103	0.025
Mulanje District	60.3	3.1	31.2	2.6	0.249	0.018	0.134	0.012
TA Mabuka	51.0	4.6	23.3	3.5	0.195	0.024	0.101	0.015
SC Laston Njema	49.6	5.2	21.4	3.6	0.183	0.026	0.092	0.015
TA Chikumbu	55.9	4.2	27.5	3.5	0.225	0.024	0.120	0.015
TA Nthiramanja	72.0	2.5	42.4	3.0	0.326	0.020	0.186	0.015
TA Nkanda	73.3	2.4	42.1	2.9	0.325	0.019	0.181	0.014
SC Juma	74.6	2.6	42.6	3.2	0.327	0.020	0.181	0.014
Mulanje Boma	41.1	6.1	18.8	4.4	0.157	0.032	0.081	0.020
Phalombe District	78.1	2.0	52.9	3.5	0.396	0.025	0.243	0.023
TA Mkhumba	81.1	2.2	56.7	4.0	0.423	0.029	0.264	0.027
TA Nazombe	73.4	2.0	46.4	2.9	0.351	0.020	0.207	0.018
Phalombe Boma	37.8	9.9	17.0	7.3	0.142	0.052	0.072	0.032
Chikwawa District	54.9	3.1	28.1	3.6	0.226	0.024	0.122	0.018
TA Ngabu	64.2	4.4	35.3	5.0	0.279	0.034	0.156	0.025
TA Lundu	41.7	4.5	20.0	4.1	0.165	0.028	0.087	0.019
TA Chapananga	57.3	3.9	28.8	4.0	0.232	0.027	0.124	0.020
TA Maseya	55.0	3.5	27.0	3.6	0.219	0.024	0.115	0.018
TA Katunga	61.7	4.6	34.1	4.7	0.267	0.032	0.149	0.024
TA Kasisi	53.2	3.2	24.9	3.2	0.205	0.021	0.106	0.015

POVERTY MEASURES FOR TRADITIONAL AUTHORITIES AND URBAN ADMINISTRATIVE WARDS (CONTINUED)

Area Name	Poverty headcount		Ultrapoverty headcount		Depth of poverty		Severity of poverty	
	value	s.e.	value	s.e.	value	s.e.	value	s.e.
TA Makhwira	45.1	4.9	20.8	3.7	0.173	0.026	0.089	0.017
Chikwawa Boma	50.2	7.8	26.0	6.6	0.208	0.046	0.113	0.031
Ngabu Urban	38.3	7.3	17.2	5.2	0.144	0.038	0.074	0.023
Nsanje District	49.5	4.0	23.9	3.3	0.196	0.023	0.104	0.016
TA Ndamera	36.3	5.0	13.7	2.9	0.123	0.022	0.058	0.013
TA Chimombo	24.5	6.1	7.5	2.7	0.074	0.023	0.033	0.012
TA Nyachikadza	32.7	13.4	11.1	7.1	0.105	0.055	0.049	0.030
TA Molo	50.4	3.6	23.4	3.2	0.193	0.021	0.099	0.015
TA Tenganj	48.8	4.7	22.5	4.0	0.187	0.027	0.096	0.018
SC Mbenje	59.2	4.2	30.8	4.4	0.244	0.029	0.131	0.021
TA Malemia	59.2	3.1	28.2	3.6	0.229	0.023	0.116	0.017
TA Ngabu	43.4	3.7	18.5	2.6	0.158	0.018	0.078	0.012
SC Makoka	61.1	6.7	34.3	6.3	0.268	0.044	0.151	0.032
Mwabvi Game Reserve	98.7	1.5	90.6	7.0	0.679	0.071	0.500	0.084
Nsanje Boma	43.3	9.6	20.3	7.1	0.167	0.051	0.087	0.032
Balaka District	68.7	3.8	39.0	4.1	0.299	0.027	0.164	0.019
TA Nsamala	68.2	4.4	38.0	4.7	0.294	0.031	0.160	0.022
TA Kalembo	73.8	3.4	43.6	4.0	0.330	0.026	0.183	0.019
Balaka Town	39.3	5.5	17.5	4.0	0.147	0.029	0.074	0.017

Standard errors are provided to use in judging whether or not the difference in poverty measures for two areas is statistically significant. That is, it allows one to determine whether or not one can claim with a high degree of confidence that poverty levels between the populations of the two areas really differ.

Quantitatively, a Z-score can be calculated using the standard errors and the poverty measures to assess whether the difference between the two measures is significant. In its simplest form:

$$Z = \frac{\text{measure}_1 - \text{measure}_2}{\sqrt{s.e._1^2 + s.e._2^2}}$$

where measure_1 is the poverty measure for the first area, measure_2 is the poverty measure for the second area, $s.e._1$ is the standard error of the poverty measure for the first area, and $s.e._2$ is the standard error of the poverty measure for the second area.

If the absolute value of Z is greater than 1.645, the probability is less than 10 percent that there is no real difference in the poverty measure between the areas; if greater than 1.960, the probability is less than 5 percent: The higher the Z-score, the more likely there is a real difference between the areas.

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RELATED PUBLICATIONS

Additional materials on social statistics and on poverty in Malawi are available from the National Statistical Office in Zomba.

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ABOUT THIS ATLAS

No maps on social statistics in Malawi have been produced for wide distribution for at least 10 years. This atlas combines information and analysis of the 1998 Population and Housing Census and the 1997-98 Integrated Household Survey, together with some sectorally specific data, to provide policy makers, students, educators and interested individuals with a better and more up-to-date understanding of the spatial distribution of the characteristics and living conditions of the people of Malawi.

Although a broad range of social statistics are considered in the atlas, the over-riding focus is on poverty. The spatial patterns seen in the atlas will provide the reader with insights regarding key geographic factors associated with poverty, thereby assisting in the development and in the geographic targeting of programs designed to reduce it.

This atlas is produced as an extension of the work of the National Statistical Office and the International Food Policy Research Institute carried out jointly under the Poverty Monitoring System of the government of Malawi. The Poverty Monitoring System was established in 1997 to closely monitor the economic and social situation of the population and to analyze the impact, effectiveness, and efficiency of poverty-oriented policies, programs, and projects.



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ISBN 0-89629-714-4



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