four variables: Ministry of National Planning and Economic Development MNPED, Aug. 2015). After the initial conversion/adjustment/linking process to the township object data in GIS the dataset could be directly used for the visualisation process. The Ministry of Health datasets also contain information on the number of beds per hospital and township, although these deviate strongly from the MNPED data (Ministry of Health: total number of hospitals in Myanmar: 1,083; MNPED: total number of hospitals in Myanmar: 1,001); in some townships the data concur, in others they vary widely. For the map the MNPED data on the number of doctors per hospital per township were used as these data were available in a coherent dataset. It is, however, unclear whether these data are more reliable. The datasets could not be mixed, which prevented information on hospital beds per 1,000 persons being provided. The three variables are presented using a color graduation in symbols classified according to size. The size classification was selected in order to permit a better visualisation of the 330 object data; the proportion of urban population was added as background information. The development of an operational workflow between GIS and the Desktop Publishing System was necessary for this so as to guarantee the error-free assignment of the color classes to each symbol – the aim was to minimize errors in the manual submitting of the graphic attributes; the graphic attributes were assigned through layer management.

- Education level: The three education maps are drawn from data from the 2014 Census. In all three maps the percentage share of over 25 year olds with a school qualification (primary to higher education) is related to a) the absolute number of over 25 year olds with a school qualification, b) the percentage share of 25 year olds with the highest school qualification in the township population, c) the percentage share of the school level of all those with a school qualification over 25 years old (classed in primary, middle and high School). The preparation of the census statistics for the GIS dataset of the townships was, as usual, complicated (Romanisation problem).

- Higher education, location and students: The three maps are based on data from the Ministry of Education on the 169 (as of 2016) locations of institutes of higher education in Myanmar; this includes universities, degree colleges and colleges. Interviews with colleagues helped in assigning the institutes to disciplinary categories. The locational data was linked to the towns in GIS. The resulting maps show a) the locations of the higher education institutions with their subject area classified by city, b) the number of students per city plus the proportion of students in each discipline. Furthermore, c) the number of students in each higher education institution and subject area is linked with the student-teacher ratio and recorded in a comprehensive list of higher education locations.

Overall, the automatic processing of the maps in GIS was hindered by the problems caused by the very varied Romanisation of the Myanmar names, which prevented automatic linking. This necessitated the very complex and time-consuming preparation of the statistical data for the 330 townships. Many of the datasets made available (maps and statistics) are characterized by inaccuracies and incoherency; in some cases they are incomplete. Little can be said about data reliability, as few verification or plausibility investigations have been documented, even in the academic literature. Experience from fieldwork shows that data from the lowest administrative levels are the most precise and reliable; the village-tract and ward-level data and data from the individual institutions are usually the most accurate. Often data were only available on the district level and were thus not suitable for use at the scale of the administrative basis of the 330 townships.

Regine Spohner and Frauke Kraas
For the first time in thirty years, a national census was conducted in Myanmar from 29 March to 10 April 2014. Preliminary results were available from 30 August 2014, the first official findings were published on 29 May 2015.

The census was conducted by the Myanmar Ministry of Immigration and Population (MoIP) in accordance with international standards and with technical support from the United Nations Population Fund (UNFPA) and financial aid from international donor institutions. In total, the census cost about 58.5 million USD, the Myanmar government provided more than 15 million dollars (UNFPA 2013).

More than 100,000 specially trained enumerators – mostly administrative personnel and teachers – visited almost 11 million households in the 15 states and regions of the country, reaching almost 98% of the total population. The official “census night” was the night of 29 March 2014, i.e. every person was counted in the place where they spent that night. Effectively however, as is usual with censuses elsewhere, the count period extended over two weeks. This was especially necessary because of the inaccessibility of villages in the countryside and mountain regions. Every individual was counted, regardless of nationality, religion or age. Not included were an estimated 1.2 million people in the regions of Rakhine, Kachin and Kayin State affected by ethnic conflict, which were not surveyed for security reasons (UNFPA 2015).

The households were visited personally by the enumerators between 7 a.m. and 6 p.m. As well as normal family households the population in institutions – e.g. hotels, monasteries and military barracks – as well as special groups (e.g. construction and port workers in provisional housing or people living on the streets) were counted. All persons present, i.e. not just those on the official Household Registration List, were counted.

The population had been thoroughly well informed of the reason for the census – the collection of statistics to plan the reform process –, the process of enumeration, the census questions and the extent of data collection, via television, radio, posters, flyers and the internet. The information material was available in Myanmar and English as well as numerous ethnic languages (e.g. Kachin or Chin-Laizo).

A Census Law passed in July 2013 protects the confidentiality of the personal data collected. Furthermore, there was explicit reassurance that the census information would not be used for the purpose of taxation, registrations, verification or detention (the latter in the context
of the requirement that de jure every individual on the Household Registration List has to register; but migrant workers in particular often fail to meet this requirement).

Demographic and socio-economic data were collected, including: age, sex, family composition, marital status, religion, ethnic identity, migration status, education, employment, births, deaths and handicaps as well as housing standards (house type, ownership status, electricity and water supply, communications, sanitary facilities, building materials and the means of transport available).

PREVIOUS CENSUSES AND POPULATION ESTIMATES

Since 1872 twelve censuses have been carried out in Myanmar: in 1872 and 1881 (both only in Lower Myanmar), 1891, 1901, 1911, 1921, 1931, 1941, 1953-55 (in three incomplete enumerations), 1973, 1983 and 2014. The total population of Myanmar grew from 22.9 million (1963) through 28.9 million (1973) to 35.3 million in 1983 (the second most recent census; MoHRA 1984, Than Than Thwe 2004, Spoorenberg 2013: 310, Kraas/Spohner 2015). In 1997, the country’s population was about 46.4 million.

Before the census of 2014, Myanmar’s population was estimated at about 60.5 or 60.98 million on the basis of growth projections. The census of 2014 recorded the considerably lower – but not really surprising – figure of 51.486,253 inhabitants. The miscalculation was due to the use of too high a growth factor of about 2.0% (Spoorenberg 2013: 310 and 2014), based on the forward projection of earlier fertility rates and an assumed increase in life expectancy from 60.4 to 66.8 years (1983 to 2003). Also, international migration was not taken into account (Spoorenberg 2013: 312).

While migration occurred from the late 1980s due to civil war, famine, landlessness and unemployment as well as in response to political persecution, labour migration rates rose in the last ten years, particularly because of the possibility of achieving higher earnings in the neighbouring states of Thailand and Malaysia. As well as about one million labour migrants, more than 400,000 refugees fled the country in 2009, so that the number of Myanmar citizens living abroad was estimated at up to 1.5 million (2010).

RESULTS OF THE 2014 CENSUS

The most important results of the census can be summarised as follows (MoIP 2015a, MoIP 2015b, UNFPA 2015, Kraas/Spohner 2015, MoLIP 2016a, band c):

- The total population figure of 51,486,253 includes estimated (not enumerated) figures of 1.09 million in Rakhine State, 69,753 in Kayin State and 46.600 in Kachin State.
- In rural regions the natural growth rates are often twice as high as the national average, with simultaneously increasing migration rates.
- Overall Myanmar, with an average population growth rate of 0.89%, is demographically relatively stable compared to other developing countries. In comparison with the 1970s the population growth rate has more than halved.
- About 50% of the population is under 27 years of age, although the proportion of children is falling.
- Nationwide there are 100 women to 93 men, reflecting men’s lower life expectancy and the markedly higher foreign migration rate for male workers. Currently, life expectancy is 60.2 years for males and 69.3 years for females (MoLIP 2016a: xii).
- Some States/Regions had far lower fertility than others; Chin State had the highest TFR (5.0 births per woman), which was no less than 3.2 births higher than in Yangon Region. The level of fertility is also influenced by the high proportion of females who remain never married: some 12 per cent of women aged 50-54 have never married. The 2014 Census showed that the marital status of a woman is closely related to her educational attainment. The higher a
woman’s level of education, the higher the probability of her remaining never married. However, while there is a clear correlation between fertility and women’s level of education, education is not the single cause of low fertility in the country, there are other contributing factors. It is important to state that education for women is essential for the future development of Myanmar.” (MoLIP 2016a: xi).

- Particularly in urban regions, falling fertility rates (births per woman) are slowing down natural increase: the average number of births per woman has fallen from 4.7 (1983) to 2.3 (2014), which is equivalent to stabilising the current population figures.

- Life expectancy at birth has risen to an average of 66.8 years (men: 63.9, women: 69.9 years) and is among the lowest in Southeast Asia. Average life expectancy in urban regions is 72.1, in rural areas it is 65.5 years.

- Child mortality (under 5 years) and infant mortality at 62% and 72% respectively per 1000 live births is almost twice as high as the average for Southeast Asia. “The lifetime risk of maternal death is 7.3 per 1,000 women, which means that one in every 137 women dies as a result of pregnancy or childbirth. Maternal mortality is the most preventable of all causes of death for women and is determined by the social and economic status of the mother” (MoLIP 2016a: xi-xii).

- The number of households has risen to 10.87 million, with the highest increases since 1983 in Shan State (119%), Kayin State (116%) and the Yangon Region (108%).

- Household size has fallen to an average of 4.4 persons per household. 70.2% of households have between two and five members; the largest average household sizes are to be found in Kachin State (5.1 persons/household), the lowest in the Ayeyarwady Region, Magway Region and Nay Pyi Taw (4.1 persons/household).

- In addition to Nay Pyi Taw, “there are other States/Regions in which high levels of recent in-migration were reported; these include Kachin, Kayah and Kayin. These States are all located on the border with Thailand or China and appear to have an economic dynamism that comes from the large amount of cross-border trade that occurs through these States. Policies designed to increase the number of cross-border entry points will likely provide increased opportunities for employment, and therefore migration” (MoLIP 2016b: xii-xiii).

- Detailed information on the migration of Myanmar citizens to other countries had not previously been published. The 2014 census results cite an overall figure of 2.02 million Myanmar citizens living abroad, 61% of whom are men and ca. 83% between 15 and 39 years of age. Most of the migrants come from Mon State (427,000), Kayin State (323,000) and Shan State (236,000 individuals). 70% work in Thailand, 15% in Malaysia. “Through backward projection methods, the current study estimates that in 2014, a total of 4.25 million persons who were born in Myanmar were living abroad at the time of the Census. International migration is clearly dominated by men. The sex ratio among such migrants is 156.3 men per 100 women” (MoLIP 2016: xii).

- In total, 58,859 foreigners reside in Myanmar in 2014, among them 23,812 Chinese, 23,903 Indians, 2,286 Pakistanis, 755 Bangladeshis and 8,103 others.

- In 2014, 89.8% (87.9%) of the population were Buddhists, 6.3% (6.2%) Christians, 2.3% (4.3%) Moslems, 0.5% (0.5%) Hindus

<table>
<thead>
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<th>TOTAL</th>
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<td>THAILAND</td>
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<td>USA</td>
<td>37,577</td>
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<td>OTHERS</td>
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</table>

Former conventional household members living abroad (MoPF 2016: 20, based on 2014 Myanmar Population and Housing Census)
Population pyramid of the Union of Myanmar - total, urban, rural (MoIP 2015a)

Population pyramids of regions and states with total population (thousands) and female/male share (%) (MoIP 2015a)
and 0.8% (0.8%) Animists; 0.2% (0.2%) were of other religions and 0.1% (0.1%) mentioned no religion (MoPF 2016: 22).

- Almost 90% of adults countrywide are literate, but in some regions the figures are considerably lower (e.g. 64.6% in Shan State). Male literacy rates are slightly higher than female rates; the greatest divergence between the sexes is 16.6% difference (in Chin State).

- The demographic transition has “changed the position of women, as it gives them an opportunity to play a more active role in the labour market and in community life. In Myanmar, female education has improved impressively over the last three decades. Inequality no longer exists between young males and females in terms of illiteracy. In fact, more females than males now hold higher diplomas” (MoLIP 2016a: xiii).

- 85.2% of adult males but only 50.5% of women are in gainful employment; 4% were registered as unemployed. The unemployment rate among 15-29-year-olds is almost twice as high at 7.7%.

- The population projection shows that “because of the demographic momentum up until 2050, many more young people will enter the labour market than old people will leave. In 2020, some 265,000 new jobs will be needed, a further 188,000 in 2035 and 57,000 in 2050” (MoLIP 2016a: xiv).

- More than 86% of households own their home, 7% rent, and 3% of homes are provided by the government. 79% of houses are built of wood or bamboo.

- A third of households (32.4%) have electric light. ‘However, there is a huge difference between urban (77.5%) and rural areas (14.9%) in the use of electricity as the main source of lighting. The proportion of households using battery, generator and solar systems as the main source of lighting is considerable’ (MoIP 2015c: 33).

- A third of households have mobile phones: 31.9% in the Union, 63.5% in urban and 21.0% in rural areas (MoIP 2015c: 35). Half of households have a television: 49.5% in the Union, 75.8% in urban and 39.2% in rural areas (MoIP 2015c: 35).

- 86% of rural households use firewood for cooking, even in urban areas 52% of households cook with firewood or charcoal.

- Drinking water for 31% of households comes from wells, 18.9% from springs and 9% of households have piped water. 31% of urban households use water purifiers or buy bottled drinking water.

- Countrywide more than 70% of households have improved water supplies and sanitary facilities; regional values are often lower. Only 14.4% of households have no toilet facilities.

- 38.7% of households own a motorbike and 36% a bicycle – 70% of all rural households and 3.1% have a motor car, a van or a truck.

At township level, regional developmental differences and disparities are very pronounced. Such disparities are to be found between rural and urban regions, and between the central lowlands and the frequently mountainous periphery. There are also marked differences in development potential associated with the ex-
<table>
<thead>
<tr>
<th>Religion</th>
<th>UNION OF MYANMAR</th>
<th>KACHIN STATE</th>
<th>KAYAH STATE</th>
<th>KAYIN STATE</th>
<th>CHIN STATE</th>
<th>SAGAING REGION</th>
<th>TANINTHARYI REGION</th>
<th>BAGO REGION</th>
<th>MAGWAY REGION</th>
<th>MANDALAY REGION</th>
<th>MON STATE</th>
<th>RAKHINE STATE</th>
<th>YANGON REGION</th>
<th>SHAN STATE</th>
<th>AYEYARWADY REGION</th>
<th>NAY PYI TAW</th>
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<tr>
<td>BUDDHIST</td>
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<td>5,325,347</td>
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<td>75,474</td>
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<td>84,073</td>
<td>516</td>
</tr>
</tbody>
</table>

Number and percentage of persons by religion (MoPF 2016: 21, based on the 2014 Myanmar Population and Housing Census)
Estimated non-enumerated population: 1 1,206,353, 2 46,600, 3 69,753, 4 1,090,000

Furthermore, ‘two population groups can, for different reasons, play an important role in harnessing a demographic dividend in Myanmar: women and international migrants. ... International emigrants can play a key role in obtaining a demographic dividend. As they most often draw from the unemployed, their departure leads to a decrease in the proportion of the group of economically dependent. If properly used for savings and investment, the remittances sent by migrants may be an important input for economic growth. ... The second dividend will be determined largely by the way elderly persons are supported in the future. The chance for Myanmar to reap a second demographic dividend will depend on how the active population can accumulate assets and have savings by the time they retire. Government policies to assist middle-aged workers to save for their retirement, individually or through pension funds, will help generate the conditions for a second demographic dividend’ (MoIP 2015c: 109).

Frauke Kraas, Regine Spohner and Aye Aye Myint