BBSR-Analysen KOMPAKT 06/2019

India and Europe/Germany

Spatial Structures and Trends

Today, 55 % of the worldwide population lives in urbanized areas according to the Revised 2018 UN Urbanization Prospects. These prospects estimate that the percentage of the global urban population will increase to 68 % by 2050. Against this background, the percentage of the urban population would rise in the EU from 76 % as of today to 85 %, whereas in Germany the percentage would rise from 77 % to 84 % in 2050 and in India from 35 % to 53 % (United Nations 2018).
Urbanization is thus both, an international and national phenomenon.

- In response to the ongoing urbanization, the General Assembly of the United Nations adopted the New Urban Agenda. Urban issues also constitute an integral part of its 2030 Agenda and the 17 Sustainable Development Goals.
- The Federal Government of Germany acknowledges urbanization and has thus agreed upon bilateral urbanization partnerships.

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Federal Institute for Research on Building, Urban Affairs and Spatial Development

within the Federal Office for Building and Regional Planning

Joint foreword

Given a longer history of joint efforts and collaborative actions related to urban and spatial development, the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) and the National Institute of Urban Affairs (NIUA) signed a Joint Declaration of Intent to cooperate on different aspects of evidence-based research and expert positioning as well as policy advice to their respective national institutions.

Two bilateral expert workshops and a series of joint presentations at the World Urban Forum IX of the United Nations in 2018 mark the starting points. This joint publication on spatial structures and trends in India and Europe/Germany constitutes a significant milestone in the context of our cooperation.

The United Nations remind us with their Revised 2018 UN Urbanization Prospects of the rapid urbanization changes affecting all countries worldwide. In that respect, our cooperation is an integral part of the bilateral urbanization partnership between India and Germany.

We thus would like to develop a comparable picture of the spatial structures and trends in our countries and continents, find a common data-oriented language, based on national and supranational data sources, and thus contribute to making global data sets compatible – particularly with regard to the thematic priorities set in the New Urban Agenda of the United Nations. The global picture drawn is thus completed by national and supranational details and adjustments.

Concrete solutions for meeting the challenges of urban and spatial development in our countries are nonetheless up to our respective national constitutional settings and political priorities.

We wish you a happy reading

Dr. Markus Eltges
Director of the Federal Institute for Research on Building, Urban Affairs and Spatial Development

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Role of cities

The Revised 2018 UN Urbanization Prospects clearly state that urbanized areas and cities fulfil a significant function in the development of our planet's spaces. Looking at these spaces and urbanized areas requires a global perspective in the same way as several national perspectives are necessary. The analytical view of this volume on India and Europe/Germany and their urbanized areas is referenced against international approaches. It may vary from a national and supranational perspective.

The delineation of cities related to population size and development is oriented towards respective national administrative definitions, represented in India by statutory towns as well as census towns and in Europe by the respective Local Administrative Unit (LAU) or their merger to urban areas according to national definitions. Creating a comparable picture on this issue resulted in using census data instead of more recent data which is only partially available. The degree of urbanization and urban sprawl beyond administrative boundaries has been investigated on the basis of the Global Human Settlement Layer and a 250 m grid structure. This data source ideally allows an analysis in a wider time span of data, in the case of India as well as Europe/Germany a period from 1990 to 2014, and it turned out realistic. Producing also a comparable cartographic picture entailed the use of the Lambert Azimuthal Equal-Area Projection (Šavrič/Jenny 2014) with respective mid-continentally oriented centring points and thus considering that both geographical settings of our planet are similar to continents (The Economist 2017).

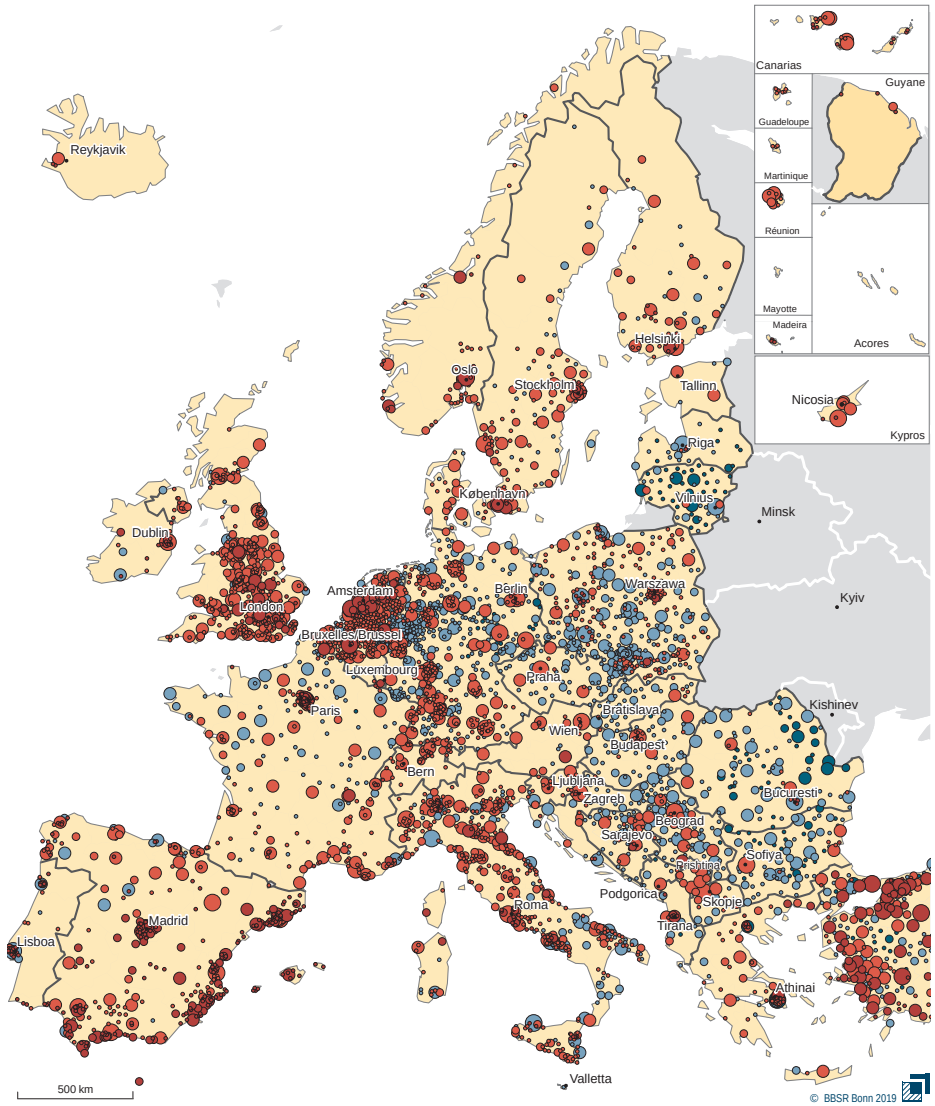
The analysis also contributes to the definition of a city as requested by the New Urban Agenda. In its paragraph 158, Member States commit themselves to strengthening data and statistical capacities in local, regional and national contexts as well as working on a place-based definition of cities and human settlements (United Nations 2017). The UN 2030 Agenda and its Sustainable Development Goals (SDGs) formulate a similar need for clarification – particularly with respect to sustainable modes of land use and a focus on the suitable utilisation of land in reference to SDG 11.3.1 (ratio of land consumption rate to population growth rate) and its underlying indicator (United Nations 2015). The place-based definition requirement underlines the necessity to focus on national and supranational approaches, zooming in territories and communicating the findings towards the UN and their services as well as other institutions.

India as well as Europe/Germany clearly show polycentric urban and spatial structures. In India, a country predominantly of villages, there are 7,933 cities and towns among which 4,041 are statutory towns and 3,892 census towns. As urban development is a state subject in India, statutory towns are declared by state governments. Census towns, on the other hand, are not declared by state governments, yet they emerge on the basis of sectoral diversifications when rural settlements qualify the census definition of (1) a minimum population of 5,000 people, (2) 75 % of all male workers engaged in non-agricultural pursuits and (3) a density of at least 400 persons per km^2 (Pradhan 2017). The period of 2001–2011 witnessed an unprecedented increase in the number of census towns in India with a total of 2,530 new census towns. In contrast, the number of statutory towns increased by only 242. A total of 322.8 million people accounting for 86 % of the entire urban population of India lived in statutory towns in 2011. Census towns housing 54.3 million urban dwellers accounted for the remaining 14 % of the total urban population. The Twelfth Five Year Plan of India acknowledges this significant role played by cities (Government of India 2013). Recent projections by Oxford Economics even estimate that between 2019 and 2035 altogether 17 of the 20 fastest growing cities in the world will be located in India (The Economic Times 2018).

In Europe, where there are altogether 113,216 cities, towns and municipalities of which 108,517 are located in the EU, the total of number cities with 20,000 and more inhabitants sums up to 4,866, in the EU to 4,057. The spatial situation is almost a balanced one between urban and rural regions. The long-term comparison of the development of cities, towns and municipalities according to settlement types and sizes considering the period from 1961 to 2011 as well as referring to NUTS 3 settlement types and historic population numbers of EUROSTAT confirms the balanced situation. Approximately 262 million people – the equivalent of 52 % of the entire population – lived in urbanized regions in 2011. The remaining 48 % and thus 240 million people called rural regions their home at that time. Measured against their numbers of inhabitants, metropolises and large cities do not play a particular role in the EU. 28 % of the EU population lived in large cities in 2011, an amount that is similar to the one of those living in medium-sized towns. 24 % of the total population of the EU were residents in small towns at that time whereas 20 % lived in rural municipalities.

The following chapters visualise the analysis. Alternating maps illustrate the spatial structures and trends in India and Europe/Germany by taking manifold views from national and supranational perspectives.

Population development of cities in Europe



Average annual change rate of the population in cities between 2001 and 2011 in % *

- up to below -1.5
- -1.5 up to below 0
- 0 up to below 1.5
- 1.5 and more

Size of city according to population in 2011 **

- 20,000 up to below 50,000
- 50,000 up to below 100,000
- 100,000 up to below 500,000
- 500,000 and more

Source: Spatial Monitoring of Europe
Origin of data: national statistical offices; 2001, 2011 censuses
Administrative data: GfK GeoMarketing, territorial units: LAU
Author: L. Kiel

* Different periods depending on national availabilities

** Cities with 20,000 inhabitants and more, cities merged based on LAU according to national criteria

Systems of cities

Cities in Europe are growing – a fact that applies at least from a pan-European perspective. According to the 2011 census results, 277 million people live in cities with more than 20,000 inhabitants. At that point of time, this represents 55 % of the EU population. The number has increased between 2001 and 2011 by 9 million people, i.e. around 4 million in small and medium-sized towns and around 5 million in large cities.

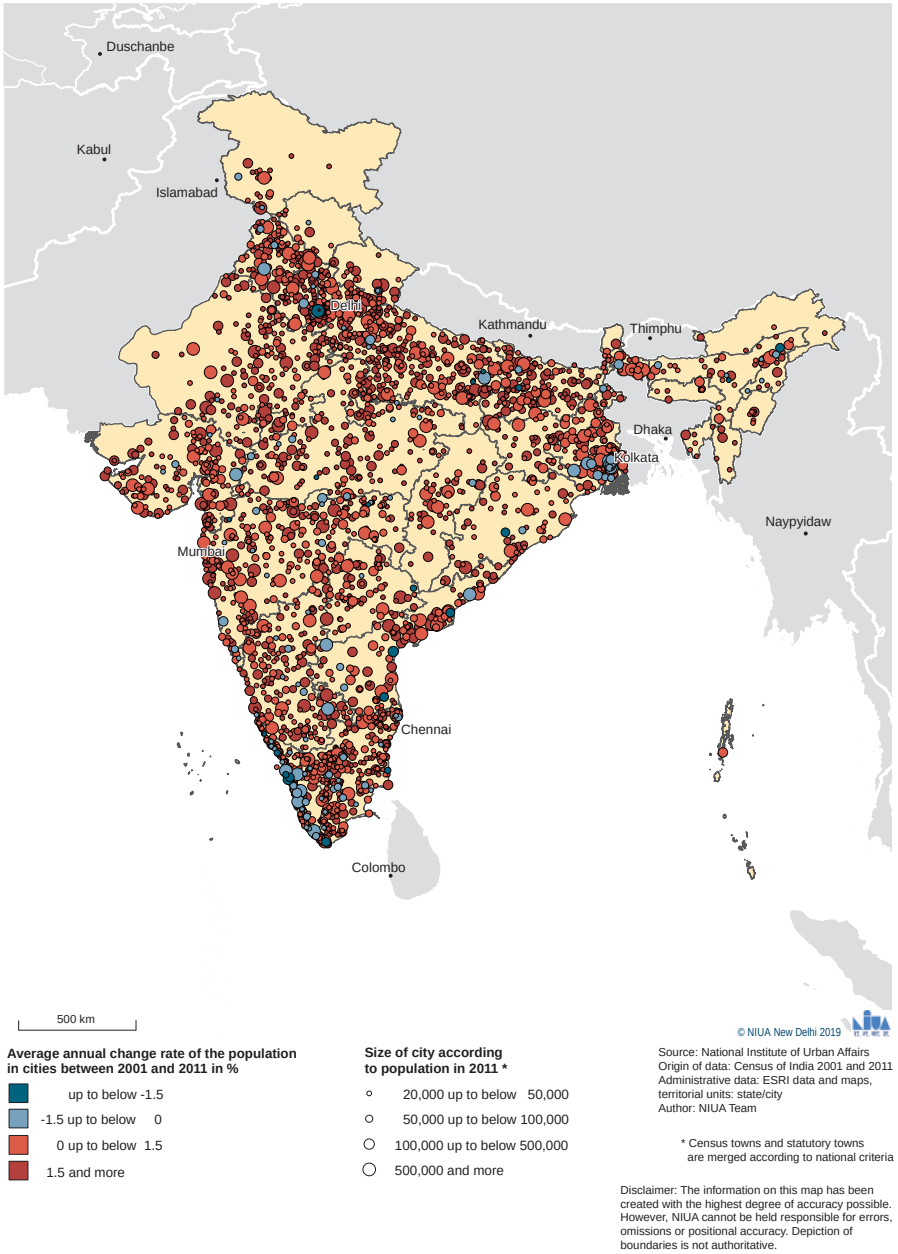
Cities in Europe do not grow in all countries and in all regions and also not in all size categories of cities. The urban population decreases in many eastern European countries, e.g. in Romania by around 8 %, in Lithuania and Latvia by 12 % each. In comparison to that, the number of urban inhabitants increases by 3.7 million in Spain and by 1 million people in France. Medium-sized cities lose inhabitants in a number of countries, especially in the eastern European countries and Germany. In Germany, these cities have lost just under 500,000 people.

Different regional trends can be found against the background of generally growing cities. In Eastern Europe, growth has, if at all, clearly concentrated on large metropolises. In Western Europe, population declines can be found especially in medium-sized cities although of a different territorial type. In Western Spain, these cities are shrinking while they are growing along the coast in the eastern and southern parts. In France, differences can be found between the north and the south, in Italy the spatial pattern is the other way round. In Germany, medium-sized cities are mainly shrinking in the central and eastern parts while they are principally growing in the north and south. Large cities over 500,000 inhabitants had been shrinking in the western parts until 2011. In some cities, similar to the situation in East Germany, the trends of the last years towards shrinking has reversed in the meantime. This is a development which can also be observed in Northern Italy.

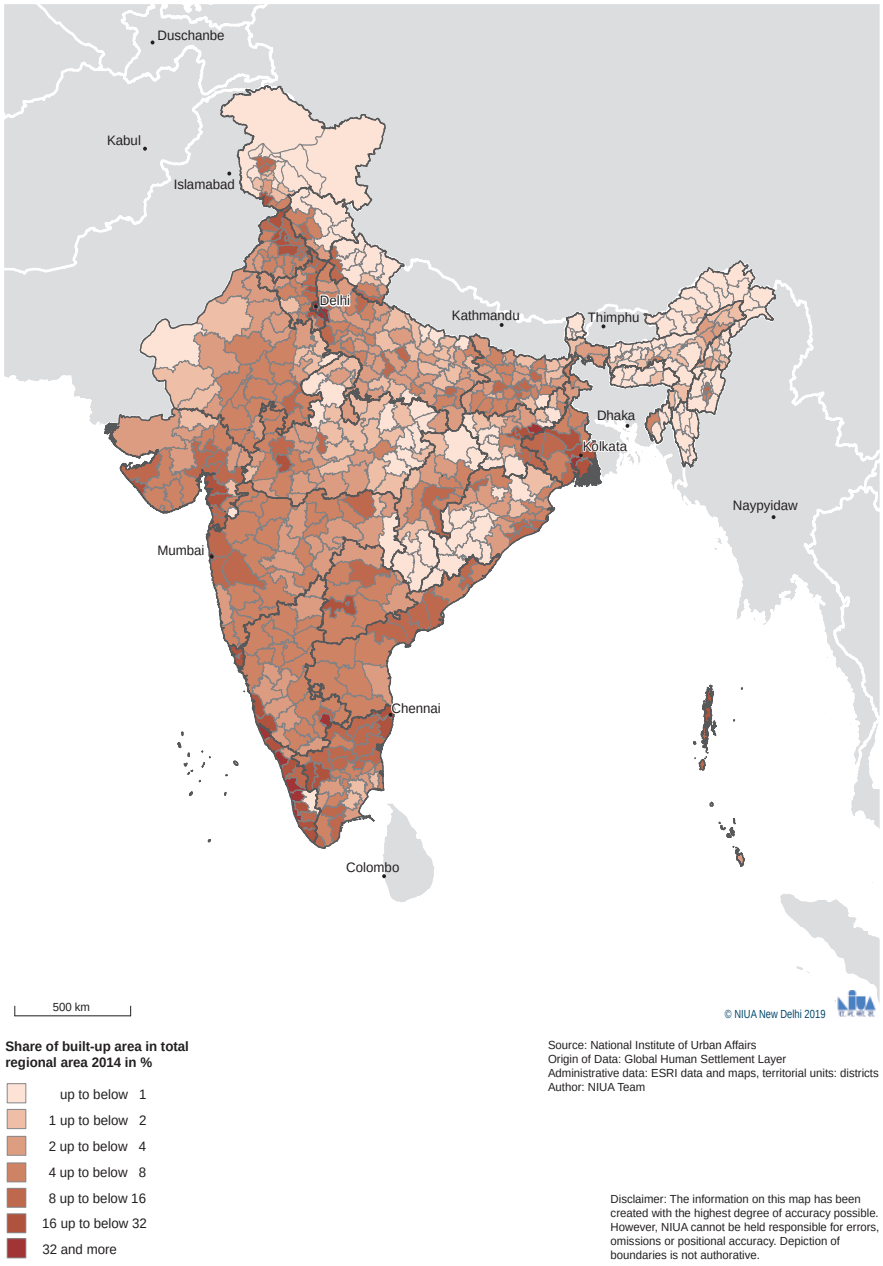
The city hierarchy in India as part of its overall polycentric structure is defined by the size classes of cities and towns according to their population size. A total of 60 % of the urban population lived 2011 in large cities (class I), nearly half of this urban population lived in non-metropolitan class I cities. However, the share of metropolitan cities with a population of 1 to 5 million people as well as 5 million and above in class I cities was 32 % and 20 % respectively. The number of metropolitan cities in India increased during the period of 2001-2011 from 35 to 52. Kerala witnessed the highest rise in the number of metropolitan cities. Out of the 18 new metropolitan cities altogether 6 were located in Kerala in the same period. Uttar Pradesh, Maharashtra, Gujarat, West Bengal, Tamil Nadu and Madhya Pradesh are the other states comprising a high number of metropolitan cities. One of the noticeable trends in this last decade was the stagnant growth rate of pre-existing metropolitan cities and a relatively higher growth rate of new metropolitan cities. The latter is to be accounted to the merger of towns and the expansion of boundaries. In fact, the New Delhi Municipal Council as well as the Mumbai Central District registered negative growth rates. However, cities like Hyderabad and Bangalore experienced growth rates above national average due to the expansion of their municipal boundaries. In 2011, there were altogether 505 class I cities in India out of which 485 were statutory towns and 20 census towns.

The number of cities and towns increased in each size class from 2001 to 2011. The highest increase was registered in class V cities followed by class IV and class III mainly due to new census towns emerging in these classes. However, the size class distribution of the number of statutory towns shows an upward shift from the lower three classes to the upper three ones. In terms of the share of the total urban population, the percentage of medium-sized cities (class II) and large cities (class I) declined from 2001 to 2011. In contrast, the share of small towns increased. States with the maximum number of new census towns are West Bengal, Kerala, Tamil Nadu and Uttar Pradesh. Tamil Nadu reported the highest number of statutory towns followed by Uttar Pradesh, Madhya Pradesh, Maharashtra and Karnataka. The distribution of statutory towns in India shows a high concentration in the Indo-Gangetic Plain in North India and in the south-east costal region in South India.

Population development of cities n India



Built-up area in India



Expansion of cities and urban sprawl

Picture of built-up area

India is a country of mainly villages as only one third of the population lives in urban areas (United Nations 2018). This becomes manifest in the share of built-up areas of the total territory of India because only 4.58 % of the entire country area was classified as built-up area in 2014. State-wise, the share of built-up areas ranged from 0.07 % in Sikkim to 88.79 % in Chandigarh. The spatial pattern of built-up areas across states shows that the Union Territory of Chandigarh had an exceptional high level of built-up areas in 2014 followed by Delhi, Daman & Diu and Puducherry. This is linked to the high level of urbanization in these territories. In Chandigarh and Delhi, 97 % of the population lives in urban areas. However, Daman & Diu (75 %) and Puducherry (68 %) also show a high level of urbanization. Among all states, Kerala and Goa show a high share of built-up areas with Goa being ranked first. However, the high level of built-up areas in Kerala are obviously linked to multiple factors resulting in the emergence of new metropolitan cities during the period of 2001–2011 and increasing housing construction activities due to the flow of remittances deriving from the Gulf Region.

The share of built-up areas in states with a relatively sound economic basis, such as Tamil Nadu, Punjab, Haryana, Andhra Pradesh, Gujarat, Karnataka and Maharashtra, was above national average but below 10 %. However, states with a low level of urbanization and a low GDP, such as Jharkhand, Bihar, Uttar Pradesh, Rajasthan, Madhya Pradesh, Chhattisgarh, Uttarakhand and Odisha, experienced a share of built-up areas lower than national average ranging from 2 % to 4 %. The lowest share of built-up areas in 2014 could be found in the north-eastern states and mountainous states of India, such as Sikkim, Himachal Pradesh and Jammu & Kashmir.

The spatial pattern of built-up areas on district level shows that Kolkata had the highest built-up area density in 2014 followed by Delhi, Chennai, Hyderabad, Mahe, Chandigarh, Mumbai, Yanam and Bangalore. The districts with the lowest built-up area density are mainly located in the north-eastern region, including Sikkim, Uttarakhand, Himachal Pradesh, and Jammu & Kashmir. The central part of India, including several districts in Odisha, Chhattisgarh, Madhya Pradesh and Jharkhand, experienced a low level of built-up area density mainly due to their high level of forest coverage and their low level of urbanization. The districts in South India show a higher built-up area density compared to the districts in North India possibly attributed to their high level of economic development and urbanization.

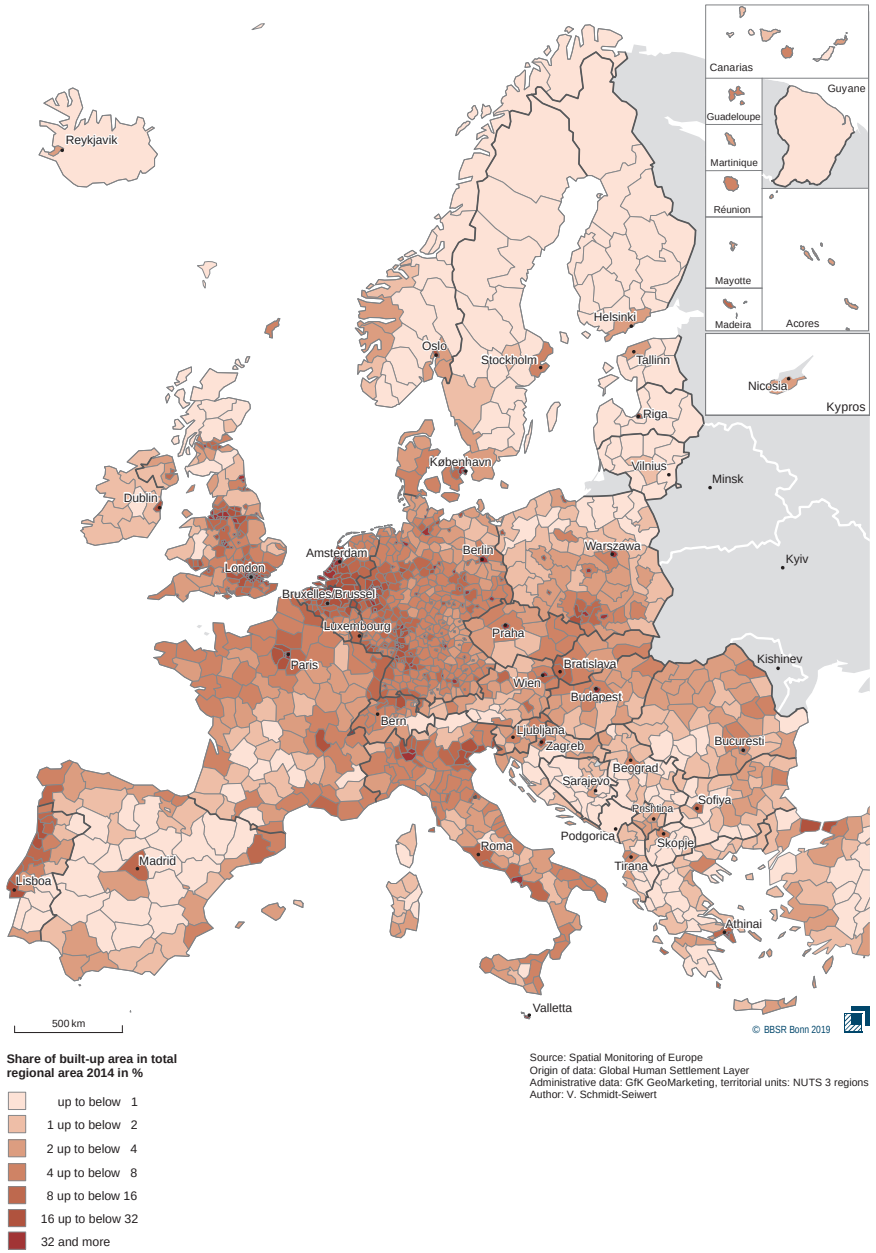
Europe provides at a first glance the impression of being a mostly unsettled area – only 4 % of the territory is classified as built-up areas. The respective national shares range from 0.3 % in Finland to 33 % in Malta. The Netherlands and Belgium, as larger countries with a higher population density, show a share of around 16% each whereas the share in the United Kingdom is 6 % and 8 % in Germany.

The axis stretching from Mid-England via the Netherlands, Belgium and the Rhine Valley to Lombardy – Roger Brunet's so-called Blue Banana (Brunet 2002) – illustrates the core and intensely interconnected settlement area of Europe, extended by built-up areas towards Paris via Lille, to Hamburg and Copenhagen as well as towards the southern part of Poland and including the Leipzig-Dresden area. The share of built-up area in the respective entire city reaches 95 % in London and 86 % in Paris. The highest equivalent value in Germany amounts to 76 % in Oberhausen and Gelsenkirchen in the Ruhr Area and just half of the city area in Berlin.

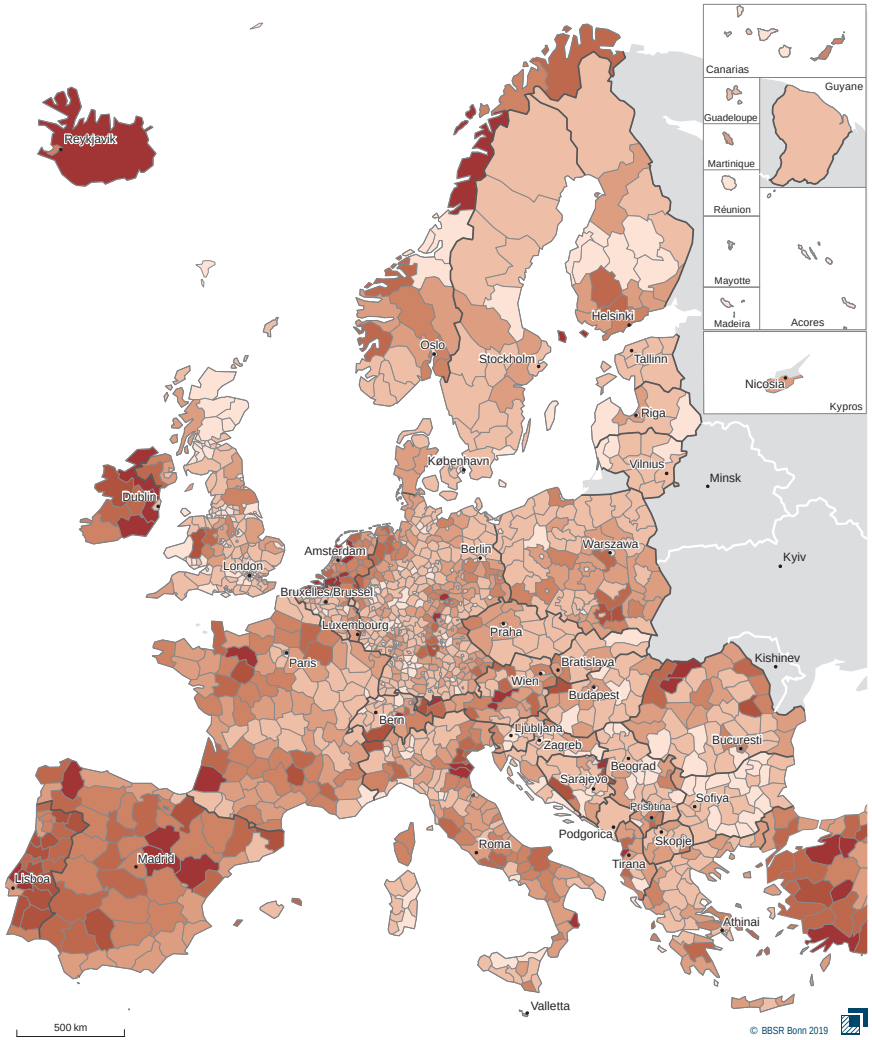
Outside the per se more densely built-up areas in the core of Europe, the coastlines of France, Spain, Portugal and Italy reveal a respective higher share of built-up areas up to 10 % outside city regions.

Around 25,000 people live per square kilometre of a built-up area in a city like Paris whereas up to 13,000 people share the same space in London, a city where the use of buildings could be more related to businesses and offices than housing. In general, one may state that building density is not necessarily linked to the population density of the respective area. Against the background of a comparable or even higher number of persons living per square kilometre than in Paris, quite a lot of sparsely populated rural areas all over Europe show a high concentration of population. Covering less than 1 % of the respective built-up area, the number of inhabitants hits for instance 27,000 in the region of Corum in Turkey or around 50,000 in the Swedish region of Jämtlands corresponding to almost the entire population of its city of Östersund.

Built-up area in Europe



Development of built-up area in Europe



Annual percentage change of built-up area between 1990 and 2014

- up to below 1
- 1 up to below 2
- 2 up to below 3
- 3 up to below 4
- 4 up to below 5
- 5 up to below 6
- 6 and more

Source: Spatial Monitoring of Europe
Origin of data: Global Human Settlement Layer
Administrative data: GfK GeoMarketing, territorial units: NUTS 3 regions
Author: V. Schmidt-Seiwert

Development of built-up area

The growth of built-up areas by no surprise takes mainly place outside metropolitan and urban centres. Built-up areas increased in all EU Member States between 1990 and 2014 on average by 1.2 % per year. The rate is with 1.3 % slightly higher when also considering EFTA countries, West Balkan countries and Turkey. The growth rate was about 0.4 % in the urban centres of the EU, 1.1 % in more densely populated regions and 1.5 % in more rural areas.

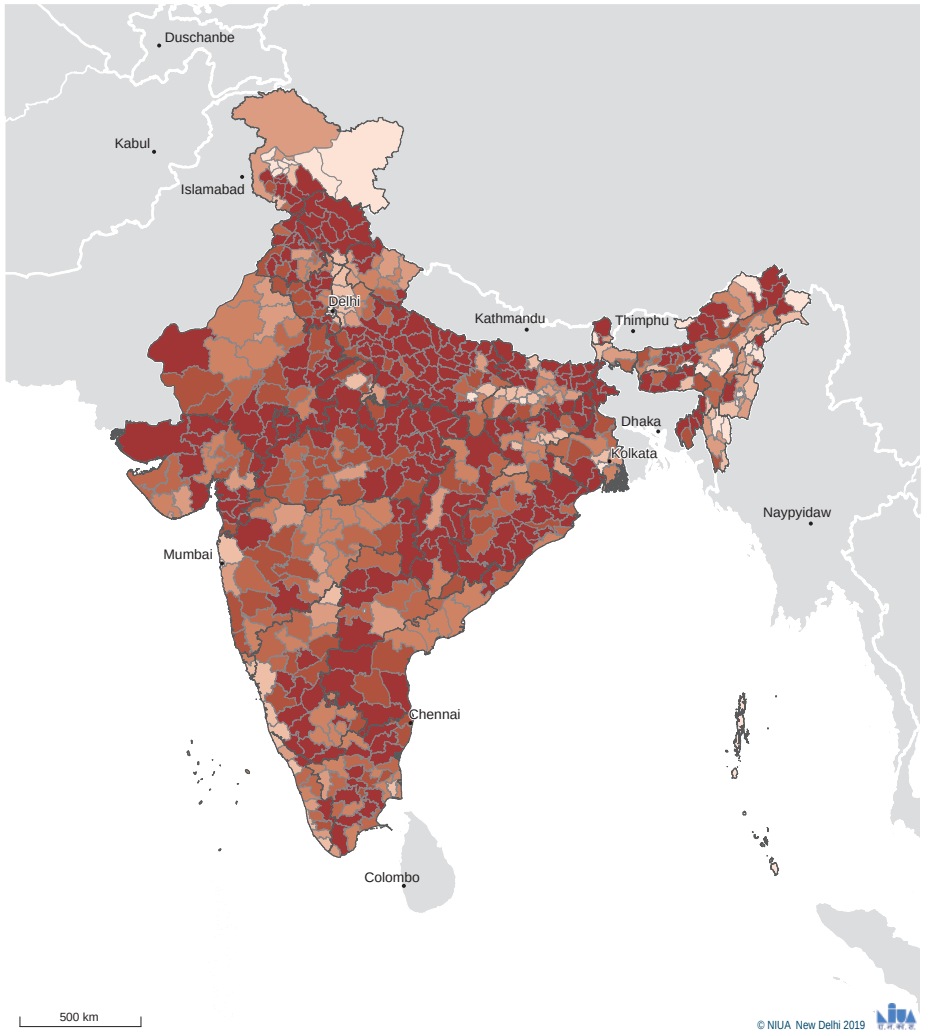
Growth differs in both perspectives – between countries and between the categories of regionalised building density. The growth rates in Austria and Belgium lie within the range of the European annual average of 1.3 %, showing in Austria almost two thirds of this rate in less densely settled regions and regions in Belgium with a large share of built-up areas being outside larger cities. Considering the growth rates in Germany and Greece of 1 % as slightly below the EU 28 average, growth concentrates with a share of 65 % in medium densely built-up areas in the first case and in the latter case new buildings are located as per 80 % in rural areas. In Spain and Portugal, the increase of 2 % in both cases is situated significantly above average whereas in the Netherlands this rate even amounts to 2.5 %. The number of built-up areas in Spain and Portugal mainly increased in rural areas, taking into account a higher portion in medium densely built-up regions in Portugal. More than half of the new building sites in the Netherlands are built in highly dense settlement areas, figuring out a growth rate of 1.3 %. Dutch urban areas show the highest growth rates in the urban areas of all EU Member States.

The territorial pattern captures the concentration of building activities in the surroundings of capitals and main urban centres. Hotspots of this development are – just to mention a few – the Dublin area in Ireland, the wider rings around Paris and Madrid as well as the South of the Netherlands, showing here an increase in the built-up area of about 6 % per year.

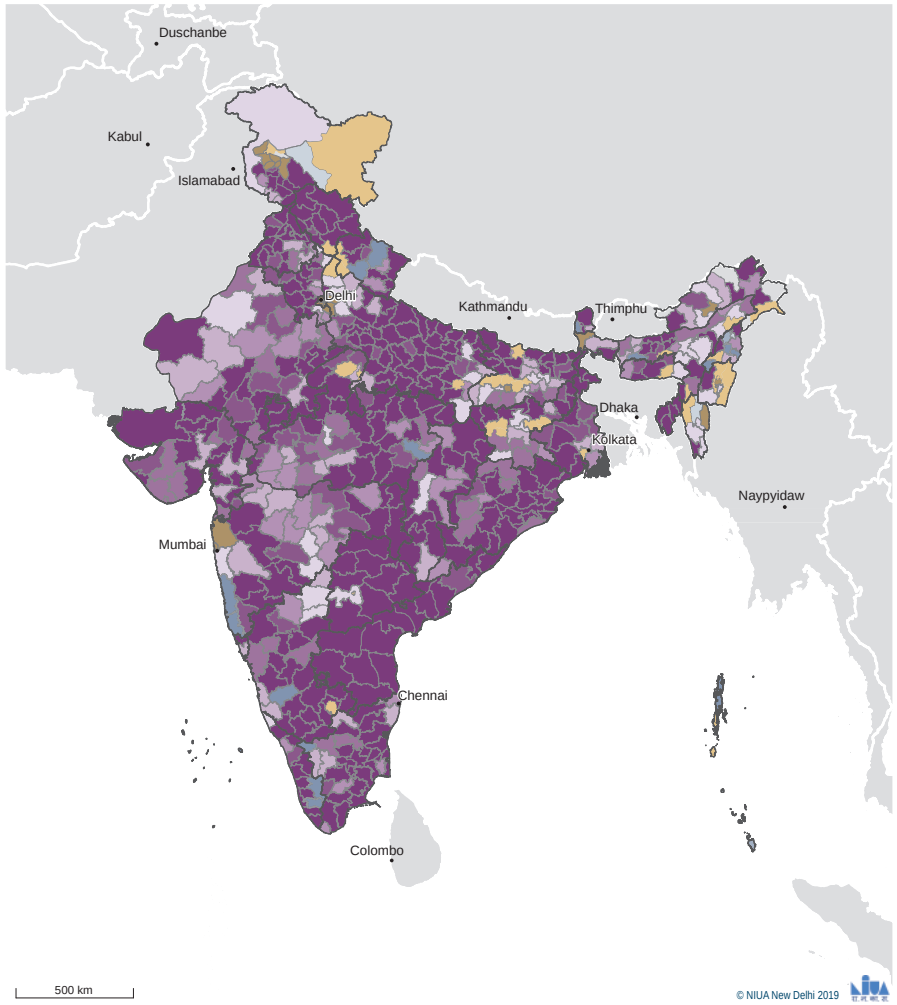
Built-up areas increased in India between 1990 and 2014 at an annual rate of 4.45 %. The Union Territory of Dadra & Nagar Haveli witnessed the highest annual change of built-up areas (18.69 %) followed by Tripura, Himachal Pradesh, Punjab, Sikkim, Uttar Pradesh, Odisha and Chhattisgarh. These states experienced an annual change in built-up areas of 6 % and above. However, Bihar, Madhya Pradesh, Gujarat, Rajasthan and Tamil Nadu are the states in which built-up areas increased with an annual rate of 5 % to 6 %. In contrast, the annual percentage change of built-up areas between 1990 and 2014 was the lowest in the Union Territories of Chandigarh, Delhi and Andaman & Nicobar Islands. Among the states, Mizoram, Manipur and Nagaland had the lowest annual percentage change of built-up areas during this period. The spatial pattern of the annual percentage change of built-up areas indicates that states in North India experienced a higher annual change than compared to states in South India. The regions with a very low change in built-up areas experienced earlier in that period a higher change.

There is a high variation in the annual percentage change in built-up areas at district level. There are 40 districts which experienced an annual change below 1 %. The majority of these districts are located in the north-eastern states, Jammu & Kashmir and Delhi, and some of them are also located in Bihar, West Bengal, Maharashtra, Daman & Diu and Mizoram. There are 464 districts which experienced an annual change of 1 % to 10 % in built-up areas. However, a total of 117 districts had an annual change of 11 % to 50 %. The Narayanpur District of Chhattisgarh and the Supaul District of Bihar saw the highest annual change of built-up areas in the same way as there are 13 other districts, of which 7 districts are located in Uttar Pradesh, experiencing an annual change in built-up areas of 50 % and above. The spatial pattern of the development of built-up areas related to districts shows that districts in Uttar Pradesh, Himachal Pradesh, Madhya Pradesh and Odisha experienced higher annual percentage changes.

Development of built-up area in India



Development of built-up area in relation of population in India



Ratio of annual percentage change of built-up area and population change between 1990 and 2014

with increase of built-up area by declining population	with increase of population higher than increase of built-up area	with increase of built-up area higher than increase of population
up to below -1	0 up to below 0.5	1 up to below 1.5
-1 up to below -0.5	0.5 up to below 1	1.5 up to below 2
-0.5 up to below 0		2 up to below 2.5
		2.5 up to below 3
		3 up to below 3.5
		3.5 and more

Source: National Institute of Urban Affairs
Origin of data: Global Human Settlement Layer
Administrative data: ESRI data and maps, territorial units: districts
Author: NIUA Team

Disclaimer: The information on this map has been created with the highest degree of accuracy possible. However, NIUA cannot be held responsible for errors, omissions or positional accuracy. Depiction of boundaries is not authoritative.

Relation of built-up area and population development

Built-up areas and population increased in all states of India between 1990 and 2014. However, the relationship between population growth and the change in built-up areas differs from one state to the other. Observing the ration change addresses SDG 11.3.1 as well as its underlying indicator.

According to the relation between the annual percentage change of built-up areas and the population development, three different groups of regions emerge in India. The first group includes those districts which experienced an increase in built-up areas and a decline in population growth between 1990 and 2014. It comprises a total of 1.07 % of the population and 1.43 % of all built-up areas in the country. In these districts, the population shrank by –0.46 % whereas the built-up areas increased at an annual rate of 2.23 %. There is no spatial clustering of these districts, yet the majority of them is located in the north-eastern states. Sikkim, Maharashtra, Tamil Nadu, Karnataka, Madhya Pradesh, Jammu & Kashmir, Delhi, Andaman & Nicobar Islands, Lakshadweep and Daman & Diu are other states where districts of this group are located. Out of 640 districts in India only 25 districts are part of it.

The second group consists of those districts where the population growth is higher than the development of built-up areas. Altogether 63 districts are part of this group covering 10.6 % of the population and 6.96 % of the entire built-up area of India. In these districts, the population grew at an annual rate of 2.06 % in the same way as the built-up areas increased at an annual rate of 1.17 %. The districts are mainly located in the north-eastern states of Jammu & Kashmir, Bihar, Jharkhand, Delhi, Uttar Pradesh and Uttarakhand. The Thane District of Maharashtra and the Bangalore District of Karnataka also fall in this group. Housing and infrastructure might constitute the main challenges there due to a mismatch of the change rate in built-up areas and population.

Those districts which experienced a higher annual percentage change of built-up areas compared to the population growth constitute the third group. This is the largest group in India including 553 districts. They comprise a total of 88.3 % of the entire population and 91.6 % of all built-up areas in the country. In these districts, built-up areas grew at an annual rate of 4.92 %. However, the population grew only at an annual rate of 1.64 %. The development of the population and the built-up areas in these districts could be explained by the progress made in most of the states since the 1990s. In the last two decades, infrastructure has improved due to economic development in the same way as population growth has declined because of improvements related to social affairs.

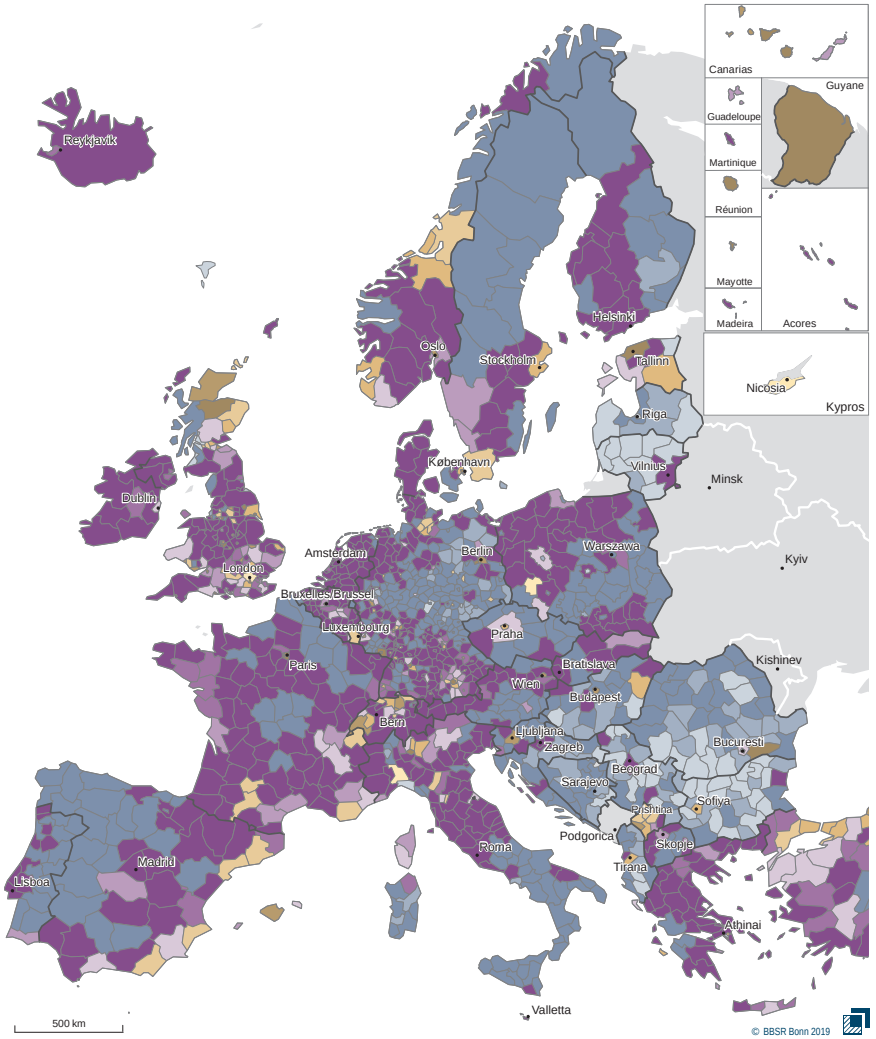
Built-up areas grew in any region all over Europe between 1990 and 2014. In relation to the population development, the picture looks different in some cases. It is the ratio of land consumption by building activities and the population development that indicates the challenges and demands for space in different regions in Europe, particularly considering reporting purposes with regard to SDG 11.3.1 and its underlying indicator.

This ratio divides regions in three groups. The first one includes regions with an increase of built-up areas and a shrinking number of inhabitants. This category comprises 36 % of the EU28 NUTS3 regions and 29 % of their population. The population here decreases on average by 0.6 % per year whereas the built-up areas annually grow with a rate of 1.2 %. Eastern European regions, central and eastern parts of Germany as well as almost the entire eastern part of Spain and the southern part of Italy dominate this territorial picture. Regions with highest discrepancies in this development are equally distributed within this geographical setting.

The second group includes regions in which the development of built-up areas is lagging behind population development. These are in Western Europe mainly metropolitan regions and in eastern Europe capital regions. Around 18 % of the EU population lives in this group of regions. The average population growth rate of 1.2 % meets here an annual increase of built-up areas by 0.4 %. This mismatch might lead in these regions to challenges in housing supply and the adjustment of infrastructure.

Those regions in which the increase of built-up areas is higher than the increase in population development constitute the third group. More than half of the EU population lives in these regions. The number of inhabitants increases by 0.4 % annually whereas the built-up areas grow with an annual rate of 1.4 %. These regions surround metropolitan regions in the more prosperous part of the EU and connect them. The regions of this group form to a certain extent the suburban catching basin of inner-metropolitan territorial limitations.

Development of built-up area in relation to population development in Europe



Ratio of annual percentage change of built-up area and population change between 1990 and 2014

with increase of built-up area by declining population

- up to below -1
- -1 up to below -0.5
- -0.5 up to below 0

with increase of population higher than increase of built-up area

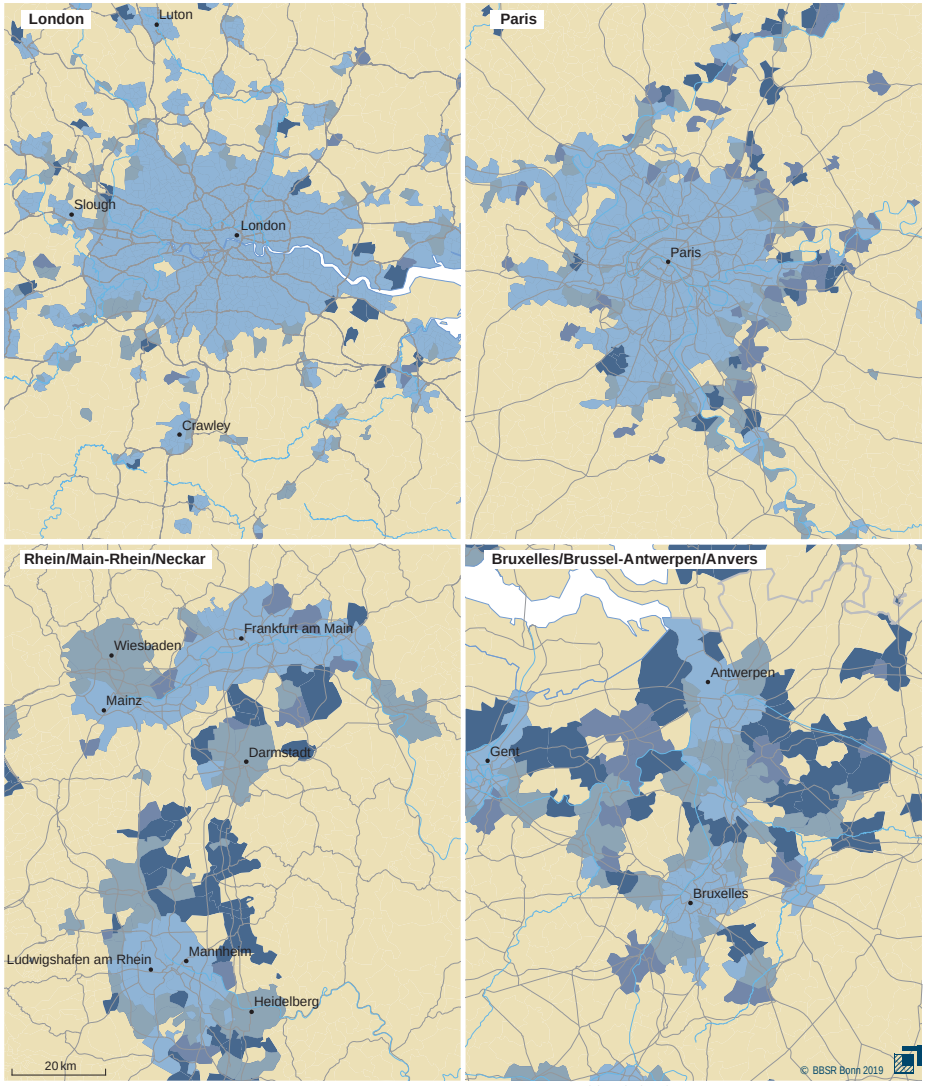
- 0 up to below 0.25
- 0.25 up to below 0.5
- 0.5 up to below 0.75
- 0.75 up to below 1

with increase of built-up area higher than increase of population

- 1 up to below 1.25
- 1.25 up to below 1.5
- 1.5 up to below 1.75
- 1.75 and more

Source: Spatial Monitoring of Europe
Origin of data: Global Human Settlement Layer
Administrative data: GfK GeoMarketing, territorial units: NUTS 3 regions
Author: V. Schmidt-Seiwert

Development of built-area in selected urban areas in Europe



Development of built-up area in selected urban areas

The built environment of metropolitan cities and areas in Europe grow – no matter which paths the demographic and economic development takes. Metropolitan regions in Poland, Italy and France show the fastest percentage increase of built-up areas from 1975 to 2014 outside the respective capital regions, for example in Krakow, Padova and Montpellier. The built-up areas there tripled in extend.

The grand metropolitan regions of Paris in the first place, followed by Madrid, Amsterdam, London and Warszawa as well as the non-capital regions of Marseille and Katowice are characterised by the highest absolute increase. About 770 km² of unbuilt land turned into built environment in the area of Paris as 430 km² did in Warszawa.

The metropolitan areas of Berlin, Hamburg, Munich, Dresden and Frankfurt/Main are the regions in Germany with the highest absolute growth of built-up areas. The land-taking for built-up area purposes summed up to 370 km² in Berlin and 230 km² in Frankfurt/Main. The highest percentage change can be found in Germany in larger cities outside metropolitan areas, such as Regensburg, Münster and Rostock.

The morphology of urban sprawl depends on the overall structure of the respective urban system, be it more mono- or polycentric. Visualising the built-up area development against various time periods from 1975 to 2014 and on the basis of a distinct above-average share of built-up area of more than 25 % by LAU unfolds different types of urban sprawl.

The metropolitan region of Paris with a more monocentric appearance in the wider regional perspective grows from the edges of its dense built-up areas into the surrounding areas following the main infrastructure lines. In the region of London, growth islands seem connected to cities rather point-by-point and forming a broader ring which joins public transport systems.

Urban sprawl takes place in more polycentric urban structures in-between cities which connect dense built-up area nuclei, as in the area of Rhein/Main-Rhein/Neckar in Germany. Against an intense built-up area increase particularly after 2000, a single multi-centre urban area started to take shape in Belgium in the areas of Bruxelles/Brussels-Antwerpen/Anvers and Gent.

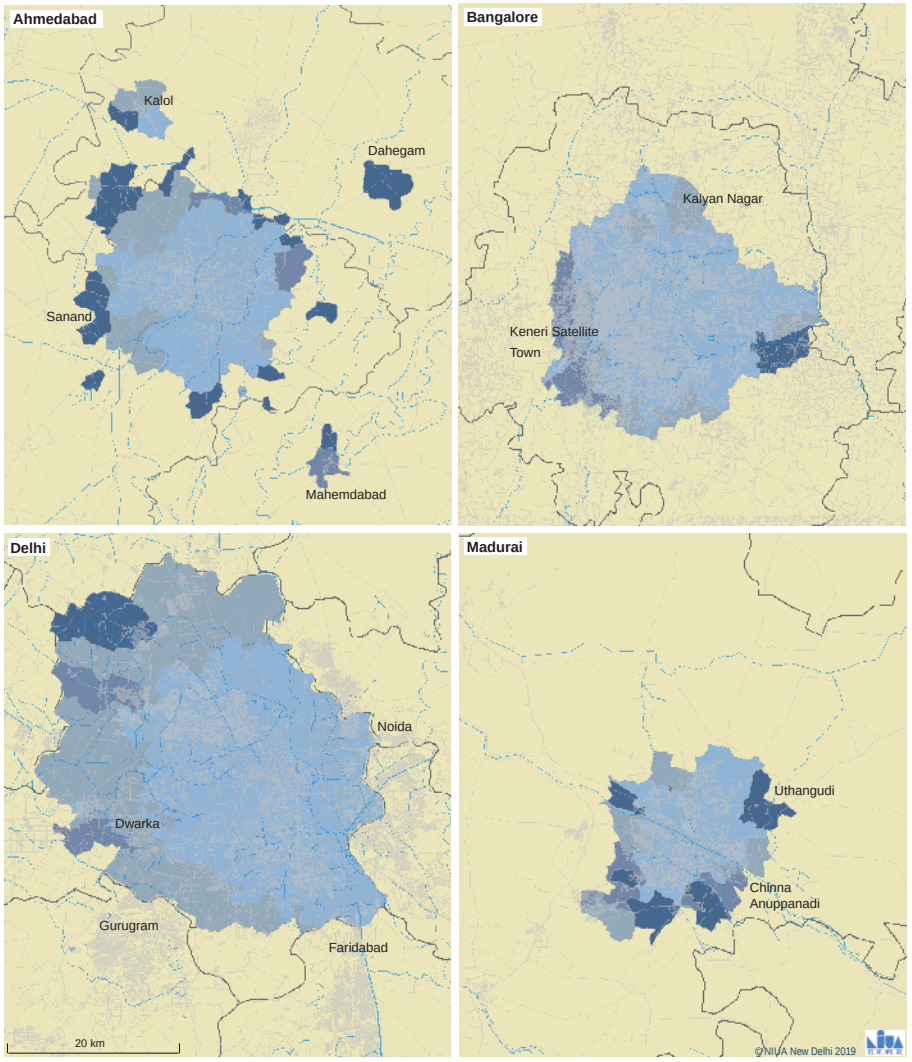
Ahmedabad is the fifth largest metropolitan city of India, home, as of 2011, to a population of 5.6 million people and characterised by a density of 10,858 persons per km². Like most cities in India, the built-up area density in the core of Ahmedabad raised in 1975 to more than 25 %. The first development plan of Ahmedabad prepared by the Ahmedabad Urban Development Authority (AUDA) in 1987 spurred the share of built-up areas in the north-western and south-western suburban parts of the city. The increase in the built-up area in these parts mainly materialised due to residential development and the launch of international operations at Ahmedabad Airport in 1992. AUDA adopted a polycentric growth approach in 2007 and declared its four growth centers Kalol, Dahegam, Sanand and Mahemdabad as planning areas.

Bangalore as the Silicon Valley of India is one of the fastest expanding cities in the country and important for the growth of its information-technology-based industries. In 2011, Bangalore had a population of 8.5 million people against a population density of 11,470 persons per km². Its built-up area mainly developed as a radial expansion of the city around its ring roads and in its peripheries due to the increasing demand of residential areas for workers in the service sector. The new residential township Kalyan Nagar thus developed in North Bangalore a well as the Keneri Satellite Town evolved in the south-west periphery of Bangalore during the period of 1990–2000, resulting in an increase in the built-area of above 25 % in both cases.

Delhi is the Capital City of India and its second largest metropolitan city following Mumbai. The city is home, as of 2011, to a population of 16.4 million people and characterised by a density of 14,153 persons per km². As a historic city, its core is densely built. More than 25 % of the city was already built-up area in 1975. Its expansion happened in the peripheral north-west and south-west mainly from 1975 to 1990 due to emerging unauthorised residential colonies. In the period of 1990–2000, the Delhi Development Authority (DDA) developed Dwarka in its south-west as a residential area, resulting in an increase in the built-up area of more than 25 %.

Madurai has been a major settlement for two millennia and holds prominence till date as the second largest city in Tamil Nadu by area covered and the third largest city by population hosted. In 2011, Madurai had a population of 1.47 million people and was characterised by a population density of 9,903 persons per km². As an ancient city, its core experienced already in 1975 a built-up area of more than 25 %. From 1975 to 1990, the built-up area increased in its eastern and western peripheral parts showing a rise of above 25 % in 1990. Between 2000 and 2014, urban sprawl predominantly happened in its peripheral north-eastern and south eastern as well as southern parts with the Uthangudi Area and the Chinna Anuppanadi Area as prominent examples.

Development of built-up area in selected urban areas in India



Development of share of built-up area by cities between 1975 and 2014

up to below 25 %

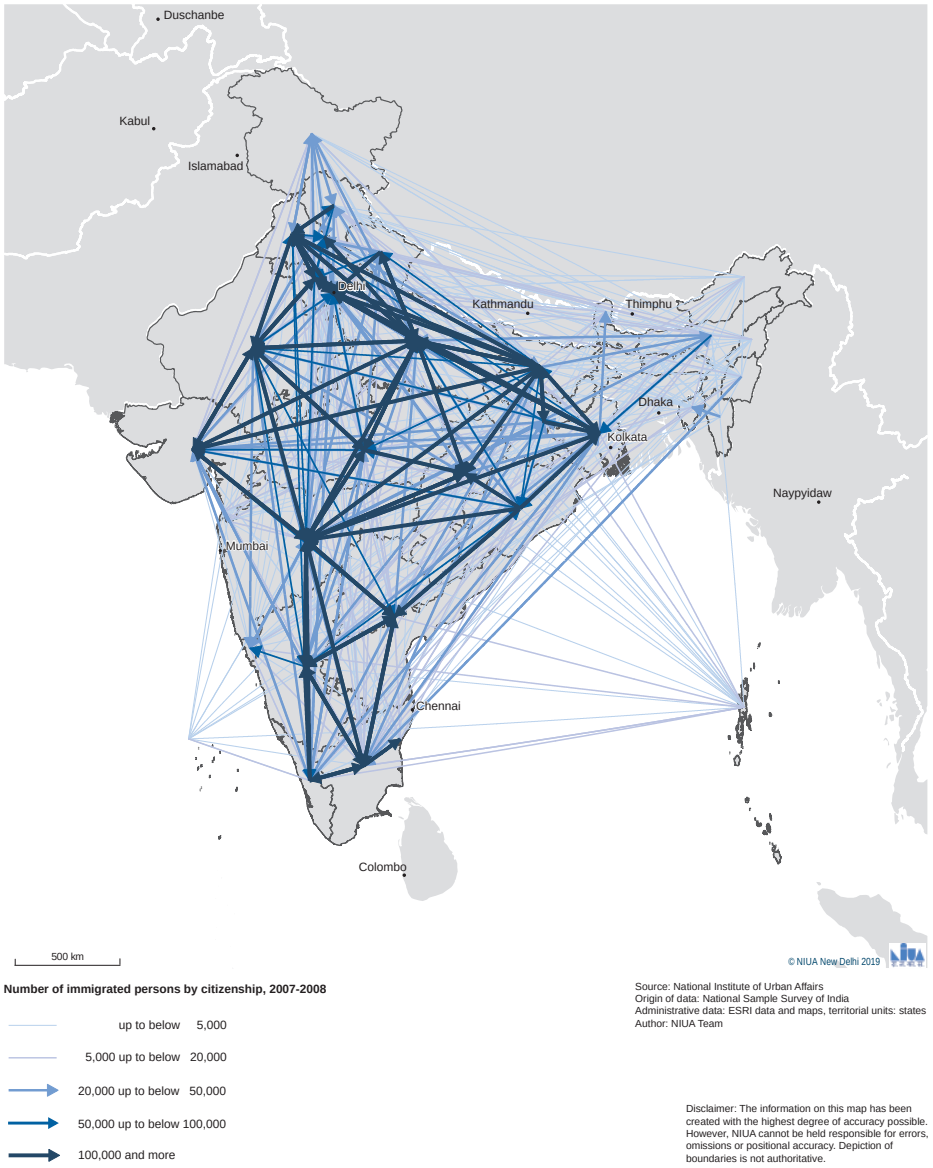
more than 25 % in the year

1975 1990 2000 2014

Source: National Institute of Urban Affairs
Origin of data: Global Human Settlement layer
Administrative data: ESRI data and maps, territorial units: cities
Author: NIUA Team

Mayor roads
Waterways

Immigration in India



Migration

Immigration in India

Compared to international migratory flows is the inter-state migration in India significant. In the absence of recent data from official sources the latest round of the National Sample Survey of India (2007–2008) shall serve as analytical basis for drawing the spatial pattern of migration in the country. The survey estimated in that period 326 million internal and 4.44 million international migrants. However, the provisional figures of the 2011 Census show that 453 million migrants moved inside India. Latest estimates of UNDESA (2017) conclude that 16.59 million Indians live abroad. More than one third of the population of India (37.47 %) are migrants. The share of inter-state migration in India increased as a consequence of economic reforms mainly because of the improvement of transport and communication facilities.

The inter-state immigration flows in India illustrate that from 2007 to 2008 the highest number of immigrants was reported in Maharashtra, originating from Uttar Pradesh, Gujarat, Karnataka, Madhya Pradesh and Rajasthan. The second highest number of immigrants was noted in Delhi arriving mainly from Uttar Pradesh, Bihar, Haryana, Uttarakhand, West Bengal and Punjab. Apart from Maharashtra and Delhi, there were eight other states receiving more than one million inter-state migrants from different states, as there are Uttar Pradesh, Haryana, Gujarat, Karnataka, Punjab, West Bengal, Rajasthan and Madhya Pradesh. The lowest number of inter-state immigrants was reported in the north-eastern states, such as Jammu & Kashmir, as well as in Lakshadweep, Daman & Diu, Dadra & Nagar Haveli and Andaman & Nicobar Islands. The volume of inter-state immigration in these states comprised less than 0.1 million people in the period of 2007–2008. The top nine immigration flows ran in the same time span from Uttar Pradesh to Delhi, Maharashtra, Uttaranchal, and Madhya Pradesh as well as from Bihar to Delhi, West Bengal and Uttar Pradesh and from Gujarat and Karnataka to Maharashtra.

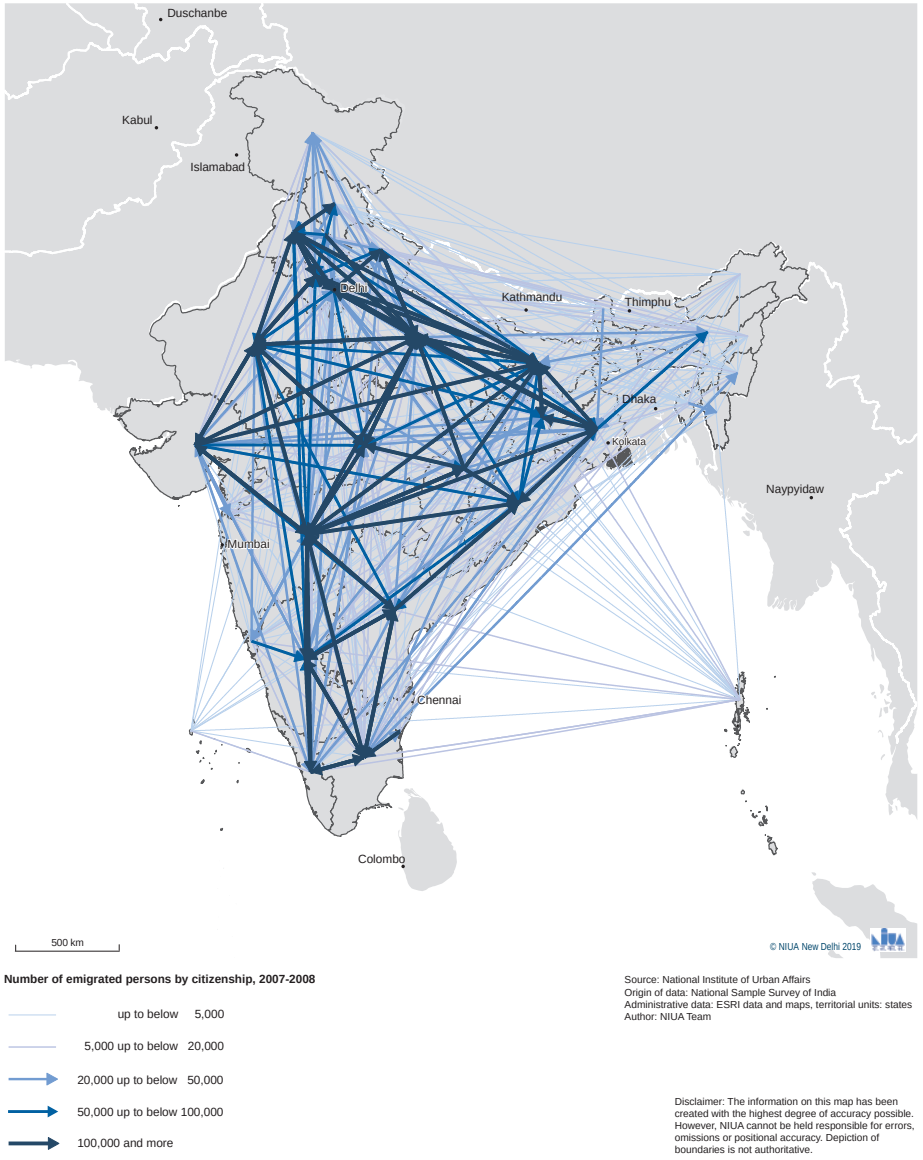
Emigration in India

Interstate emigration is often seen as the main survival strategy for people of the economically weaker regions in India. The trajectory of the economic growth in India after independence shows that some states, such as Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Jharkhand, Odisha, and the north-eastern states have been lagging behind in terms of economic development compared to other states, such as Maharashtra, Gujarat, Punjab, Delhi, Andhra Pradesh and Karnataka. Therefore, people from the backward regions of Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Jharkhand, Odisha and the north-eastern states migrated to developed states in search of employment opportunities. From 2007 to 2008, half of the emigration volumes in India derived from only four states, as these are Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan. Poverty, a high man-land ratio as equivalent to population density, stagnation in the rural economy and low wages were the main push factors in these states for people moving to developed states, particularly to Maharashtra, Delhi, Punjab, Haryana and Gujarat.

Some states, such as Maharashtra, Haryana, Karnataka, Tamil Nadu, Andhra Pradesh, Punjab, Delhi and Gujarat, which were confronted with a high immigration rate in the period of 2007–2008, also reported significant emigration volumes for the same period. These states are economically growing at a faster rate and, therefore, expectations of people from these states, especially of those being part of early-working-age groups, are also huge. Improving the communication and transport infrastructure helped the new generation migrating easily from one metropolitan city to another.

The top emigration flows can be seen in the direction from Uttar Pradesh to Delhi, Maharashtra, Uttaranchal, Gujarat and Madhya Pradesh as well as from Bihar to Delhi, West Bengal and Uttar Pradesh and from Gujarat and Karnataka to Maharashtra. The lowest flow of inter-state emigration is reported from north-eastern states. A reason certainly is that this part of India is limited in terms of developing the transport infrastructure, including its rail, road and air connectivity.

Emigration in India



Immigration in Europe

Immigration in Europe/ Germany

Migration flows are to certain extent key drivers in demographic development and predominantly follow more inward-oriented trends in the respective national context. Changes in economic and social framework conditions in the countries of origin, such as the economic and financial crisis, influence migration paths in the short term.

In 2015, countries of the EU (without Cyprus, Greece, Ireland, Lithuania, Malta) and EFTA counted altogether 4.5 million immigrants. At a share of 55 %, inner-European migration plays the most important role. Almost 2.5 million people, of which 1.3 million are from eastern EU Member States, moved from one European country to another one. Immigration from the Near and Middle East, including Syria, summed up to 900,000 people. 420,000 arrived from Africa and Asia each while 260,000 people came from America, two thirds of which originate in South and Central America.

Germany is the main destination country of immigration. 1.9 million people or 43 % of all migrants moving to the above mentioned countries got to Germany. For 470, 000 people the United Kingdom was the country of destination, another 280,000 went to Italy and 240,000 to France.

EU-internal migration from the East to the West constitutes the most important one in almost all countries. In Germany it accounted for one third of all immigration, in Austria for 29 % and for 27 % in the United Kingdom. Migration from the South to the North is another well-known migration pattern. The highest share of immigrants from the South became visible with 31 % in Luxemburg, with 28 % in Switzerland and with still 15 % in France. The exceptional 2015 refugee migration superimposed the generally more stable migration pattern in Europe. Immigration from the Near and Middle East accounted for 30 % of the migrants in Austria and for 27 % in Germany. Another 10 % each came in both countries from the Western Balkan, Ukraine and Russia.

The choice for the destination countries is often also explained by the past as well as by the respective language. That is why 40 % of immigrants in France originate in Africa, 30 % arriving in Spain are from South America as well as those 25 % migrating to the United Kingdom formerly called East and South Asia their home.

Emigration in Europe/ Germany

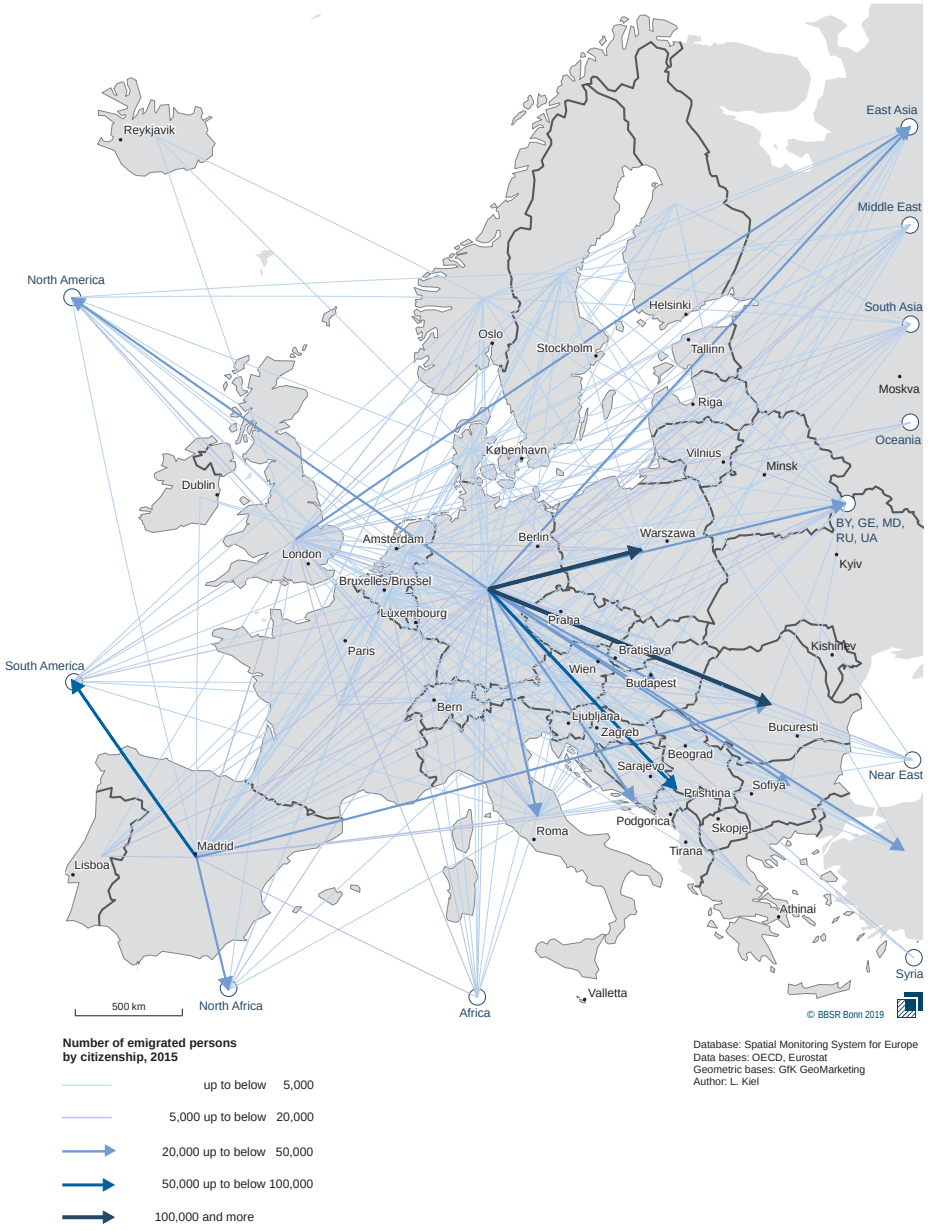
Migration flows between countries are not one-way roads. In 2015, altogether 2.1 million people left the countries of the EU (without Cyprus, France, Greece, Ireland, Lithuania, Malta) and EFTA. The emigration to eastern EU Member States and the Western Balkan, summing up to 980,000 persons, actually underlines the high turnover level between East and West. This number constitutes almost half of all emigrants of these countries. Around 500,000 people derive from western EU Member States, from southern EU Member States there are 210,000 people. The situation is the same in southern EU Member States to where 280,000 migrants could have returned.

Main emigration flows definitely have their source in Germany. Almost 400,000 of these people headed to eastern EU Member States whereas 80,000 to southern EU Member States and 90,000 to the Western Balkan. These countries are destinations for two-thirds of all emigrants from Germany. In Belgium, emigration lies at a share of 13 % each, mainly concentrated equally to the South and the East of the EU. Emigration from Luxemburg is oriented more to the South of the EU and from Italy 80 % of emigrants left for other south EU Member States.

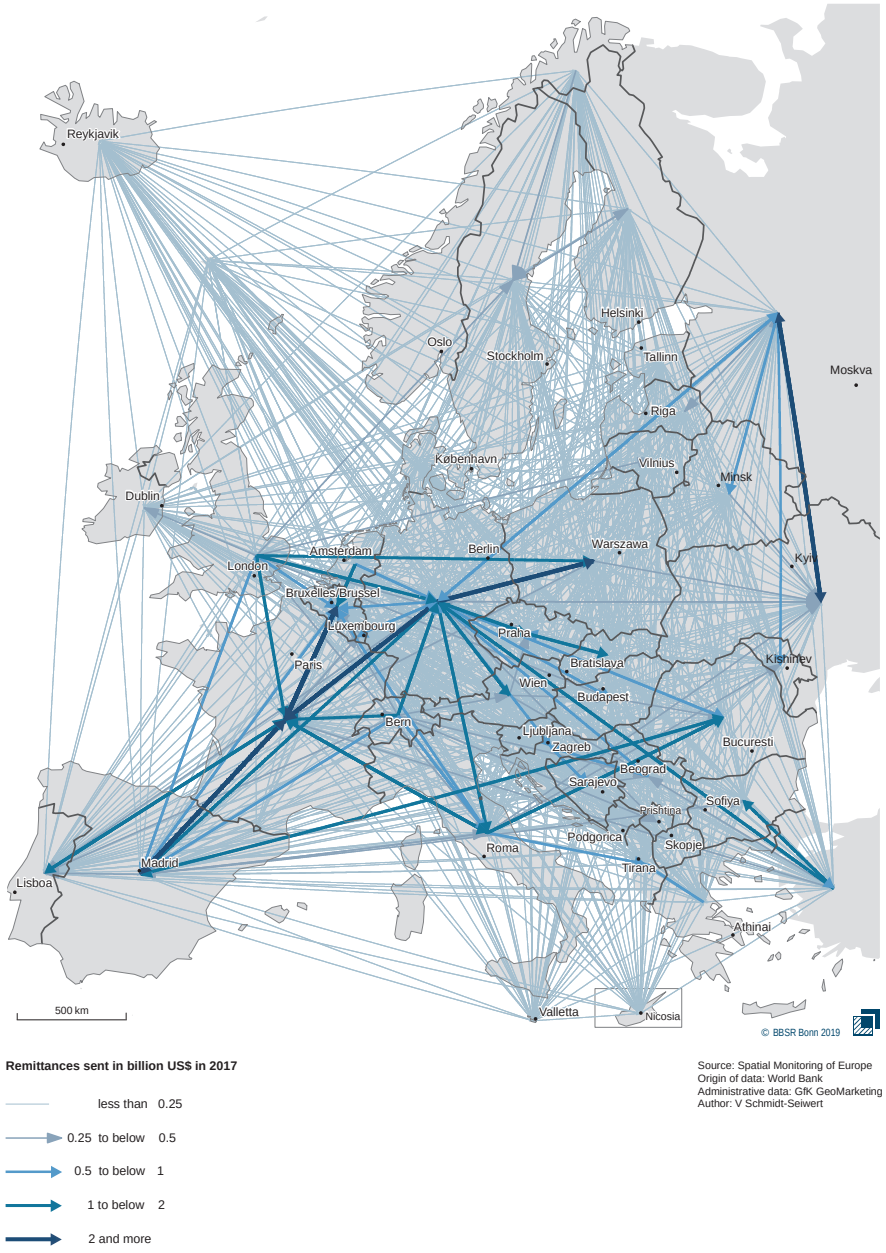
The inner-western EU emigration shows also distinct national priorities in choosing a destination. Exclusively targeting Western Europe characterises the emigration from Iceland, in Denmark this share was almost 80 %. Predominant emigration to these countries shows in Denmark a share of 53 %, in Switzerland and Norway 44 % both and Sweden 33 %. In the United Kingdom the share was of 30 % emigrants heading to East Asia and South Asia. In Spain, 22 % emigrated to South America revealing that historic relations also affect the choice of destination in emigration.

The countries of the EU and EFTA are immigration countries. The migration balance sums up to 2.4 million immigrants. The migratory intensity – the relation between migration balance and immigration – was the highest with regard to immigration from the Near and Middle East taking the situation in Syria as a special migratory one. 90 % of migrating people stayed in the countries of destination. The lowest value may be attributed to migration towards and from the eastern EU Member States at a rate of 30 % illustrating the high degree of interconnection and flows in both directions. The migration pattern within the western EU Member States at a rate of 30 % is particularly attributed to a high level of labour mobility.

Emigration in Europe



Remittance flows in Europe



Remittances

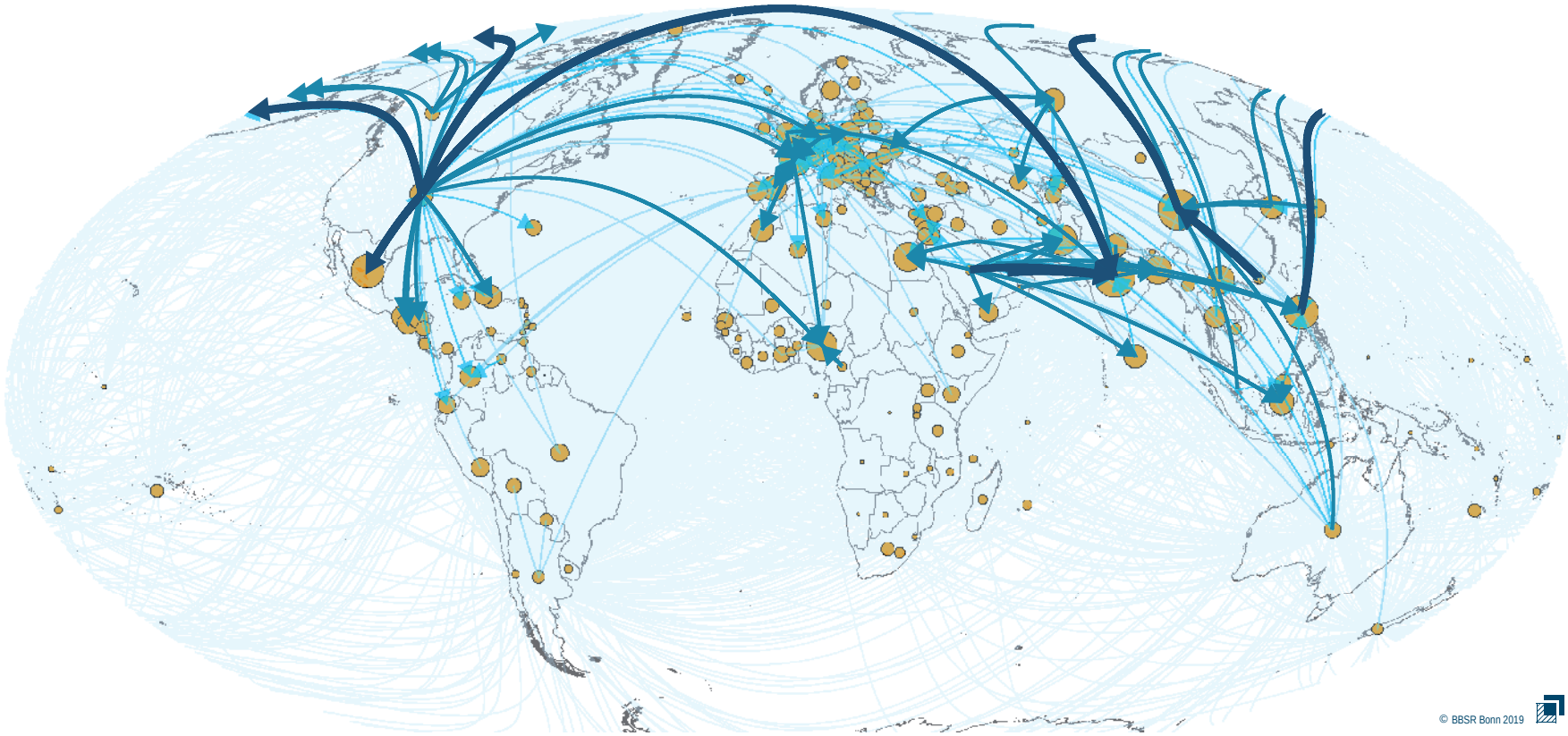
Migration and remittance flows are closely interlinked as well as remittances may significantly contribute to the development of cities and regions in receiving countries, whether they are located in Europe or are part of India. World Bank projects that remittances sent to developing countries will increase in 2018 by 10.8 % to 528 billion US$ and those to high-income countries by 10.3 % to 689 billion US$ (The World Bank 2018). Remittances attract attention, also with regard to their transaction costs. SDG 10.7 thus focuses on a considerable reduction of these costs in the future.

The top five sending and receiving countries in Europe relying in 2017 on annual remittance volumes of 2 billion US$ and more are Spain and France, France and Belgium, France and Germany, Germany and Poland, Russia and Ukraine as well as vice versa respectively. In that respect, the relation between remittance flows and the respective national GDP is a crucial one. In Romania for example, remittances constitute 2 % of the country's GDP of 211.8 billion US$ (World Bank 2017). Already in 2016, World Bank and OECD estimated that the total annual amount of remittances constitute nearly 1 % of the global GDP (World Bank/OECD 2015/2016).

While overall remittances sent from European countries to India are non-significant in general, the picture slightly shifts when looking at single countries. The share of EU countries in remittances to India laid in 2016 at 8.69 % (5.45 billion US$) of the global amount. Among the top sending countries are the United Kingdom (6th position), Italy (14th position) and Germany (16th position).

The picture is a total different one when focusing on India alone: Seen from a global perspective is India the top recipient country of remittances preceding China. In 2017, India got a total of 62.7 billion US$ constituting a global share of around 11 %. The country received half of its remittances from only three countries: the United Arab Emirates (12.5 billion US$), the United States (10.6 billion US$) and Saudi Arabia (10.2 billion US$).

Global remittance flows



Remittance flows sent in US$ billion in 2017

Top flows

from		to
USA	28.1	Mexico
USA	15.4	China
Hong Kong	14.8	China
United Arab Emirates	12.5	India
USA	10.6	India
USA	10.5	Philippines
Saudi Arabia	10.2	India
USA	6.7	Guatemala
USA	6.6	Vietnam
Saudi Arabia	6.4	Egypt

Top countries

Receiving		Sending	
India	62.7	USA	138.1
China	60.9	Saudi Arabia	44.0
Philippines	31.1	United Arab Emirates	31.1
Mexico	28.6	United Kingdom	25.4
France	24.3	Canada	23.3

Receiving [US$ billion]

- 0.001
- 0.1
- 10.0

Sending [US$ billion]

- up to below 0.5
- 0.5 to below 1.0
- 1.0 to below 2.0
- 2.0 to below 10.0
- 10.0 and more

Source: Spatial Monitoring of Europe
Origin of data: World Bank
Administrative data: ESRI
Author: L. Kiel, R. Binot

Conclusion

In a given polycentric structure, such as in India and Europe/Germany, the integration of relevant spatial actors in spatial research activities seems indispensable. Bilaterally assembled spatial patterns might help raising appropriate data-related questions. Place-based spatial pictures should subsequently be constructed in a custom-fit way.

Though both geographical settings are polycentric by nature, India and Europe/Germany also differ structure-wise to a certain extent from each other. Visualising these differences requires a common data language – in this first joint approach, for the sake of comparability, some aspects are based on census data. Some key findings of similarities and dissimilarities of both, the analytical operation methods taken as well as the analytical findings gathered and the spatial pictures created of Germany, Europe and India, run as follows.

One may for example think that an annual increase of the built-up area correlates with an annual increase of the respective population. In some cases it does, in some cases, particularly in rural regions in India and Europe/Germany, the increase of the built-up area is higher than the increase of the population in question; some of those regions even lose population in a significant number. Which are the reasons and the respective driving forces in both geographical settings for this type of land consumption and ratio dichotomy?

Zooming in territories as well as constructing time series on the basis of annual percentage changes and thus comparing structures with each other might lead to a possible answer. Land consumption usually takes place alongside transport routes – whether they are radial as in Paris and Bangalore, point-shaped like in London and Delhi or reticular as in Bruxelles/Brussel-Antwerpen/Anvers and Ahmedabad. Accessible high- or medium-dense urban development projects on the spot would certainly be the reason for this phenomenon. The spatial picture looks entirely different in rural areas in Germany, Europe and India. There, less accessible low-dense urban development projects might cause the high land consumption rate and a below-average population growth.

Looking at migration flows tells us also a narrative: the spatial migratory pattern of both continents might underline that India and Europe/Germany are primarily inner-continental migration areas, with the exception of immigration from the Near and Middle East, East Asia, North Africa and South America to Europe. Nonetheless, evidence on mass migration in general should also be considered (Collier 2018). The visual inner-continental picture is particularly evident in India. A correlation between remittance flows and migration could be drawn.

Considering the methodological approach taken by BBSR and NIUA, similarities and dissimilarities in that respect might not be that obvious. In principle, the process of data sourcing and data analysis is the same. Due to a jointly agreed layout even the visual elements are similar. What is certainly different is the status of cities: the statistical units of LAU and/or their aggregations to cities according to national delineations had been selected as common basis for producing the spatial picture of Europe Germany whereas a constitutionally motivated merger by classes of statutory towns and census towns had been employed in India.

Before drawing conclusions for planning and development, some words on economic aspects might be provided. When looking at spatial structures and trends in India and Europe/Germany through an economic lens, one may say that economic ties get more and more intertwined in the same way as they incorporate consequences for the development of territories, urbanized areas and cities. Mentioning a prominent example in that respect, China's Belt and Road Initiative (the landside link between China and Europe via the Silk Road Economic Belt as well as its seaside link via the Maritime Silk Road) could materialise in implications for both geographical spheres as well as those in-between, also considering that China is the trading partner nation

number one of India (Wagner/Tripath 2018) and the trading partner nation number one of Germany with regard to the overall turnover of export and import values measured in EURO (DESTATIS 2018).

Similar pictures could certainly be drawn by competitiveness rankings: the 2018 Global Competitiveness Report positioned India on the 58th position and Germany on the 3rd while ranking China on the 28th (World Economic Forum 2018). India sees itself as the regional power in South Asia and is thus an active member of the South Asian Association for Regional Cooperation (SAARC) as well as the country is associated with the Association of Southeast Asian Nations (ASEAN). A new actor in that respect, particularly with regard to concrete investments, is the Asian Infrastructure Investment Bank (AIIB). In promoting the Asia-Africa Growth Corridor (AAGC) – India's bilateral cooperation with Japan – the country has thus meanwhile responded to China's Belt and Road Initiative in order to underline its status as a regional power in and around the Indian Ocean (Wagner/Tripath 2018).

Which might be the consequences of the spatial patterns gathered for territorial cohesion as well as urban, regional and spatial planning, its regulations, guidelines and harmonised data-related evidence bases? Integrating urban and spatial planning authorities in international, supranational and national research activities could be a valuable step to be taken for valorising the spatial pictures. This approach would allow both, adjusting the spatial picture by carrying out blunder checks and making those carrying out planning decisions become an integral part of setting the scene and subsequently sourcing the appropriate data. In addition, supranational institutions might learn to construct in a place-based-oriented manner their spatial picture against these national and bilateral expert inputs. International and global sources like the Global Human Settlement Layer could be one basis, national ones another, preferably not only focusing on census results.

Visualising the spatial structures and trends of the different geographies is a prerequisite for understanding possible implications for territories, urbanized areas and cities. The challenges deriving from these implications are similar in various countries albeit constitutional differences. The urbanization partnerships which Germany has agreed upon with Brazil, China and India as part of the group of emerging national economies – also known as BRICS – could be an appropriate setting for addressing this visualisation.

This joint publication constitutes a prominent milestone of the cooperation between BBSR and NIUA. The underlying common understanding of taking the same path of compatible data in analysing spatial structures and trends as well as the cooperation itself are seen as procedural blueprints for further bilateral joint activities in the field of urban and spatial development.

Bibliography

Brunet, Roger, 2002: Lignes de force de l'espace européen. Mappemonde 66, 2/02. Access: https://www.mgm.fr/PUB/Mappemonde/M202/Brunet.pdf [retrieved on 29.03.2019].

Collier, Paul, 2018: Mass immigration and its global effects – for countries of origin, transit and target countries. Access: https://www.bmi.bund.de/SharedDocs/videos/DE/themen/migration/stimmen-unserer-zeit-sir-collier.html;jsessionid=BC2B6E22CC825106E482A748F0C65EB7.2_cid287 [retrieved on 29.03.2019].

DESTATIS – Statistisches Bundesamt, 2018: Außenhandel. Rangfolge der Handelspartner im Außenhandel der Bundesrepublik Deutschland. Access: https://www.destatis.de/DE/ZahlenFakten/GesamtwirtschaftUmwelt/Aussenhandel/Tabellen/RangfolgeHandelspartner.pdf?__blob=publicationFile [retrieved on 29.03.2019].

European Commission; EU Science Hub, 2016: Global Human Settlement Layer. Access: https://ec.europa.eu/jrc/en/global-human-settlement-layer [retrieved on 29.03.2019].

Government of India, Ministry of Home Affairs, Office of the Registrar General & Census Commissioner, 2019: 2011 Census Data. Access: http://censusindia.gov.in/2011-Common/CensusData2011.html [retrieved on 29.03.2019].

Government of India, Ministry of Finance, 2018: Economic Survey (2017–2018). Access: http://mofapp.nic.in:8080/economicsurvey/# [retrieved on 29.03.2019].

Government of India, Planning Commission, 2013: Twelfth Five Year Plan (2012–2017). Faster, More Inclusive and Sustainable Growth. Volume I. Sage Publications India Pvt. Ltd. Access: http://planningcommission.nic.in/plans/planrel/fiveyr/12th/pdf/12fyp_vol1.pdf [retrieved on 29.03.2019].

HSMI-NIUA, 2017: Urban India. Status of Demography, Economy, Social Structure, Housing and Basic Infrastructure. National Institute of Urban Affairs & HUDCO-HSMI. New Delhi.

Mahapatro, S.R., 2012: The Changing Pattern of Internal Migration in India. Issues and Challenges. Paper presented at European Population Conference, Stockholm University, Sweden. Access: http://epc2012.princeton.edu/papers/121017 [retrieved on 29.03.2019].

Mohan, R.; Dasgupta, S., 2005: The 21st Century. Asia becomes urban. Economic & Political Weekly, 40(3), pp. 213–223.

OECD – Organisation for Economic Co-operation and Development, 2019: Economic Outlook for Southeast Asia, China and India 2019. Access: http://www.oecd.org/development/asia-pacific/01_SAEO2019_Overview_WEB.pdf [retrieved on 29.03.2019].

Pradhan, Kanhu Charan, 2017: What is happening beyond large cities? Understanding census towns in India. Access: http://www.cprindia.org/news/6557 [retrieved on 29.03.2019].

Šavrič, Bojan; Jenny, Bernhard, 2014: A new pseudocylindrical equal-area projection for adaptive composite map projections. International Journal of Geographical Information Science, 28:12, pp. 2373–2389, DOI: 10.1080/13658816.2014.924628.

Srivastava, R., 2012: Internal Migration in India. An Overview of its Features, Trends and Policy Challenges. Workshop Compendium, Volume II: Workshop Papers, National Workshop on Internal Migration and Human Development in India. New Delhi: UNESCO/UNICEF. Access: fromhttp://www.unesco.org/new/fileadmin/MULTIMEDIA/FIELD/New_Delhi/pdf/Internal_Migration_Workshop_-_Vol_2_07.pdf [retrieved on 29.03.2019].

The Economist, 2017: Banyan. Is India a country or a continent? It is more integrated than the European Union, but less unified than the United States. Access: https://www.economist.com/asia/2017/02/09/is-india-a-country-or-a-continent [retrieved on 29.03.2019].

The Economic Times, 2018: India claims top ten in list of world's fastest-growing cities. Access: https://economictimes.indiatimes.com/news/economy/indicators/india-claims-top-ten-in-list-of-worlds-fastest-growing-cities/articleshow/66963987.cms [retrieved on 29.03.2019].

The World Bank, 2018: Accelerated remittances growth to low- and middle-income countries in 2018. Access: https://www.worldbank.org/en/news/press-

release/2018/12/08/accelerated-remittances-growth-to-low-and-middle-income-countries-in-2018 [retrieved on 29.03.2019].

The World Bank, 2017: Bilateral Remittance Matrix 2016. Access: http://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data [retrieved on 29.03.2019].

UNDESA – United Nations, Department of Economic and Social Affairs, Population Division, 2018: World Urbanization Prospects. The 2018 Revision. Access: https://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html [retrieved on 29.03.2019].

UNDESA – United Nations, Department of Economic and Social Affairs, 2017: Trend in International Migrant Stock. The 2017 Revision. New York: United Nations, Department of Economic and Social Affairs, Population Division. Access: http://www.un.org/en/development/desa/population/migration/data/estimates2/docs/MigrationStockDocumentation_2017.pdf [retrieved on 29.03.2019].

UN HABITAT; NYU – New York University, Lincoln Institute of Land Policy, 2016: Atlas of Urban Expansion. Access: http://www.atlasofurbanexpansion.org [retrieved on 29.03.2019].

United Nations, General Assembly, 2017: New Urban Agenda. Access: http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_71_256.pdf [retrieved on 29.03.2019].

United Nations, General Assembly, 2015: Transforming our world: the 2030 Agenda for Sustainable Development. Access: http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf [retrieved on 29.03.2019].

Wagner, Christian; Tripath, Siddharth, 2018: Indiens Antwort auf die chinesische Seidenstraßeninitiative. Neue Partner und neue Formate, SWP-Aktuell 1, Januar 2018. Access: https://www.swp-berlin.org/fileadmin/contents/products/aktuell/2018A01_wgn_Tripathi.pdf [retrieved on 29.03.2019].

World Economic Forum, 2018: The Global Competitiveness Report 2018. Access: http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf [retrieved on 29.03.2019].

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