Urban-Rural Development

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Demands of a Growing Population

The collapse of Interstate 35W could be blamed on the government's failure to provide adequate funding for repair and maintenance of bridges.

But another factor is the increasing demands a growing population places on our nation's infrastructure, especially in urban areas.


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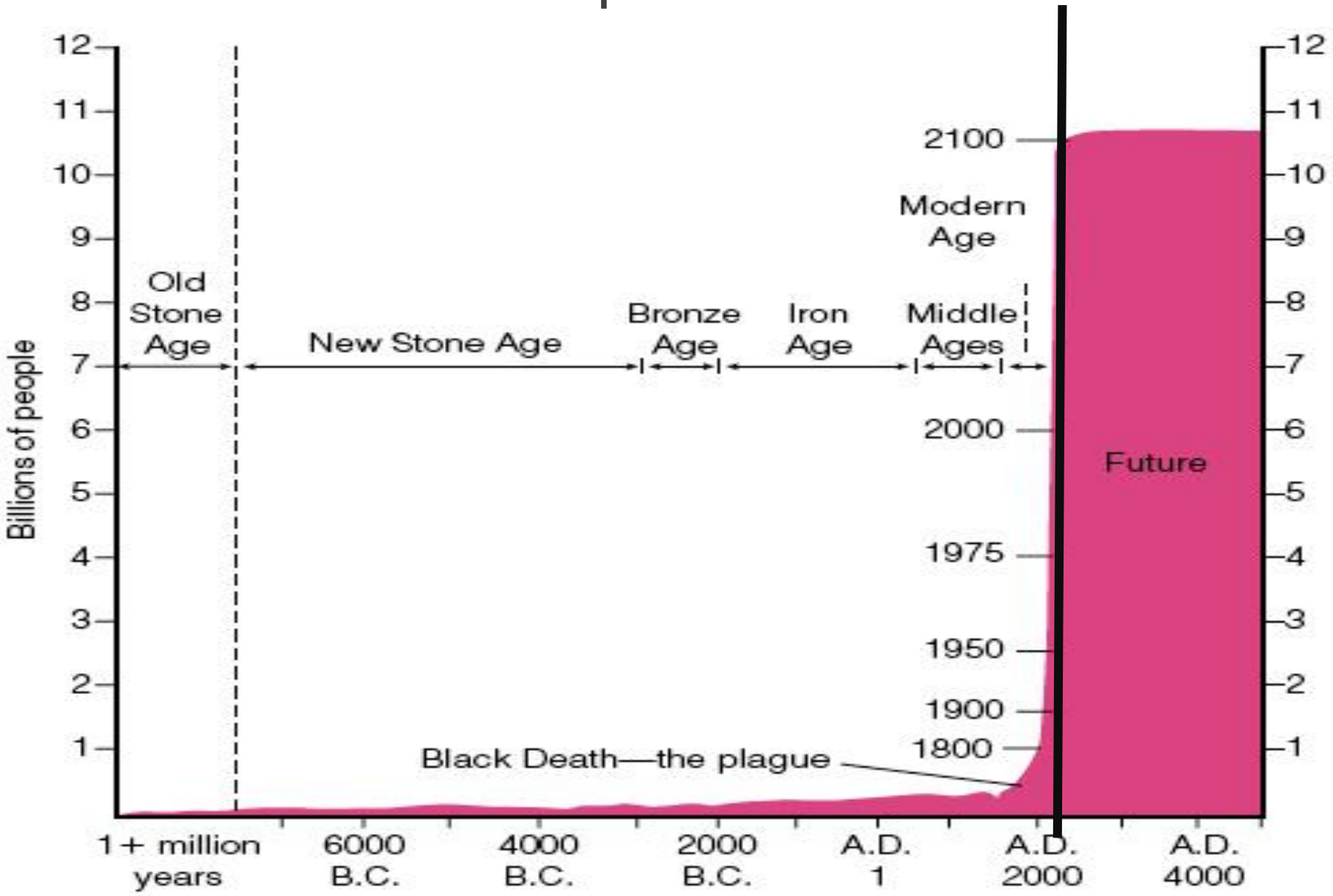
World Population Growth



World Population: History, Trends, and Projections

- For 99% of human history population growth was restricted by disease and food supplies.
  - At the dawn of agriculture, about 8000 B.C., the population of the world was approximately 5 million.
  - About 1,000 years to grow from 16 to 32 million.
  - Less than 1,000 years to grow to 64 million.
  - Over the 8,000-year period up to 1 A.D. it grew to 200 million (some estimate 300 million or even 600, suggesting how imprecise population estimates of early historical periods can be).

World Population: History, Trends, and Projections

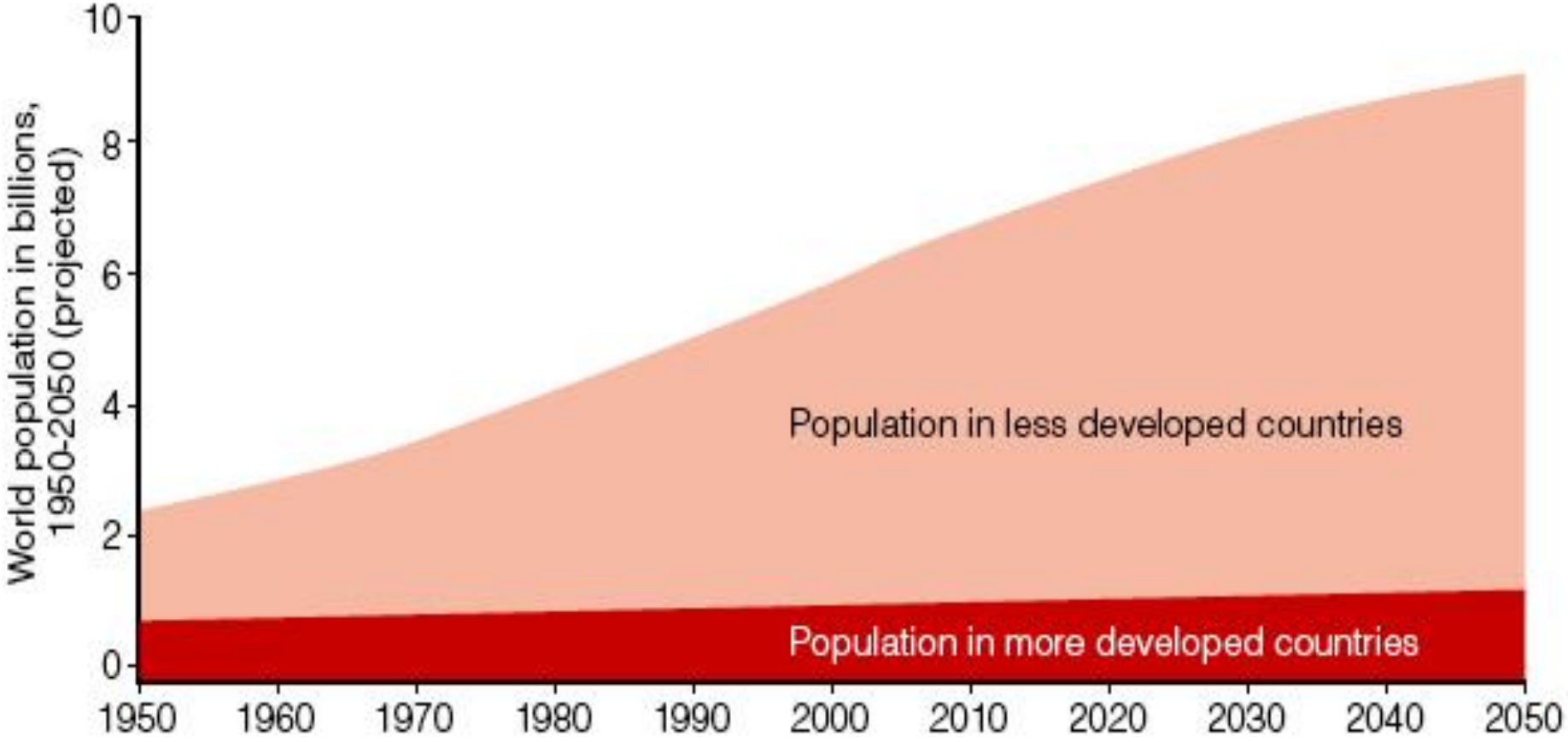
- This continued until the mid-18th century, when the Industrial Revolution improved the standard of living for much of the world.
  - Improvements included better food, cleaner drinking water, improved housing and sanitation, and medical advances.
- Under the industrial revolution: whereas it had taken all of human history until around 1800 for world population to reach one billion, the second billion was achieved in only 130 years (1930), the third billion in 30 years (1960), the fourth billion in 15 years (1974), and the fifth billion in only 13 years (1987).

- During the 20th century alone, the population in the world has grown from 1.65 billion to 6 billion in 2000.
- In 1970, there were roughly half as many people in the world as there are now, which means doubling time took about 40 years.
- It is expected more than 200 years for population to double again or might not double in size again.
  - Fertility rates have dropped around the world
  - A child born today may live to see stabilization of the world's population
- According to the United Nations, the world's population is growing at an annual rate of 1.14%, resulting in the addition of 76 million people per year.

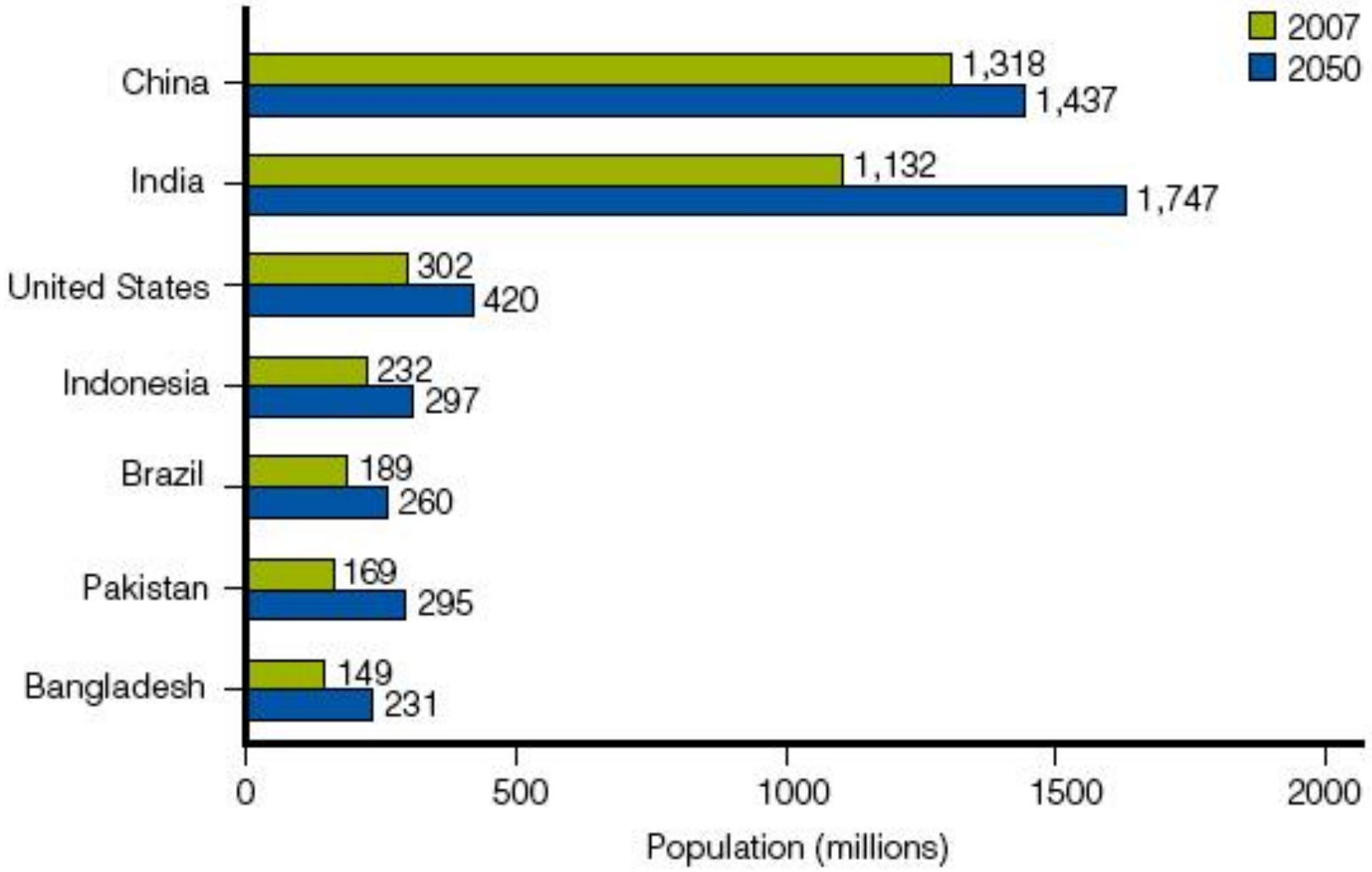
Top 20 Largest Countries by Population Size (as of 2017)

1	China	1,415,424,469
2	India	1,355,074,009
3	U.S.A.	326,924,996
4	Indonesia	266,987,625
5	Brazil	210,976,323
6	Pakistan	201,075,971
7	Nigeria	196,220,837
8	Bangladesh	166,484,833
9	Russia	143,962,998
10	Mexico	130,868,827
11	Japan	127,164,920
12	Ethiopia	107,713,284
13	Philippines	106,621,866
14	Egypt	99,501,509
15	Vietnam	96,556,424
16	D.R. Congo	84,190,236
17	Germany	82,305,718
18	Iran	82,070,064
19	Turkey	81,997,558
20	Thailand	69,193,137

Global Population Growth Is Driven by Developing Countries



World's 7 Largest Countries



Fertility Rates by Region

World	2.6
More-developed	1.7
Less-developed	2.7
Less-developed (excluding China)	3.1
Least-developed	4.6

The region of the world with the highest fertility rate is Africa, where women have an average of five children in their lifetime.

Population Momentum

Continued population growth as a result of past high fertility rates that have resulted in a large number of young women who are currently entering their childbearing years.

Despite the below-replacement fertility rates in more developed regions, population in these regions is expected to continue to grow until about 2030 and then to begin to decline.

Below population replacement levels - population size may eventually drop because fewer people are being born than are dying

Factors influence on population change

- Terms
  - *Size* - overall number of people
  - *Composition*- make-up of the population, including sex ratio, age distribution (dependency ratio), and religious or ethnic representation in the population
  - *Distribution*- density or concentration in various portions of the land
- Demographic processes that affect population
  - *Fertility*- birth rate
  - *Mortality*- death rate
  - *Migration*- movement of people from one place to another

Population growth

- Age and sex impact individuals' positions in society and population growth/decline
  - *Dependency ratio*- the number of people under age 15 and over age 64 to the number between 15 and 64
  - *The sex ratio*- the ratio of males to females in the population
    - Determines how many women are eligible to give birth and the number of potential spouses
  - *Population pyramids*- a visual depiction of sex and dependency ratios

Migration: Why and where people move

- *Push-pull theory*- some people are pushed by their original locations by wars, plagues, famine, political or religious conflicts, economic crises, or other factors, and are pulled to new locations by economic opportunities or political and religious tolerance

- *Internal migration*- movement within a country
  - Rural to urban common
  - Rates are high because of pull migration

- *International migration*- movement from one country to another
  - Often influenced by political unrest, discrimination, or environmental conditions as well as economic conditions
  - Has been tightly controlled in western countries recently, but illegal immigration still common

Policy implications of population patterns and economic development

- Since economic prosperity is a political goal, population policies depend upon whether the government feels that population growth is *good* or *bad* for the economy
- Population can be *reduced* by improved sex education, access to contraceptives, and providing opportunities for citizens (especially women) to obtain jobs and education.
- It can also be *increased* by immigration, safety net, pro-family laws (= pro-natalist policies eg. a one time baby bonus, ongoing child benefit payments or tax reductions. Some impose penalties or taxes on those with fewer children. Some nations, such as Japan, Singapore,[14] South Korea,[15] and Taiwan, have created incentives for larger families among native stock. Paid maternity and paternity leave policies can also be used as an incentive. For example, Sweden has generous parental leave wherein parents are entitled to share 16 months paid leave per child, the cost divided between both employer and State.)

What is Urbanization?

- A complex process of social and economic change whereby a society is transformed from an essentially rural to a predominantly urban one.
- Transformation of a society from a rural to an urban settlement.
- From a demographic perspective, the urbanization level is best measured by the urban population share, with the urbanization rate being the rate at which that share is growing.

How to Define Urban?

- There is no international consensus on how to determine the boundaries of urban areas or identify when a settlement is 'urban', as evidenced by the diversity of national urban definition summaries in the publications of the United Nations Population Division (2014).
- Alternatively, some countries have multiple criteria, perhaps including size, density, administrative level, employment, infrastructure and facilities.
- As well as varying between countries, definitions also change over time.

In most countries with size criteria, the minimum population size ranges from 1,000 to 10,000.

- Sweden where a built-up area with at least 200 households, with gaps of no more than 200 metres between them, is defined as urban
- Mali, the 2009 census used a cut-off of 40,000.
- US- Persons living in cities or towns of 2,500 or more or density of more than 1,000 people per sq mile (US census).
- Thailand -of 7,000 or more.

Urbanized area - One or more places and the adjacent densely populated surrounding area that together have a minimum population of 50,000.

Characteristics of Urbanization

a) Mobility of population from agricultural to nonagricultural areas.
b) Concentration of population in a new place of habitation or a place characterised by a new way of life.
c) Variety of professions other than agriculture and continued mobility in these occupations, mobility both - vertical and horizontal.
d) A particular mode of habitation and non-agricultural (i.e., industrial, commercial etc.) pattern of economy.

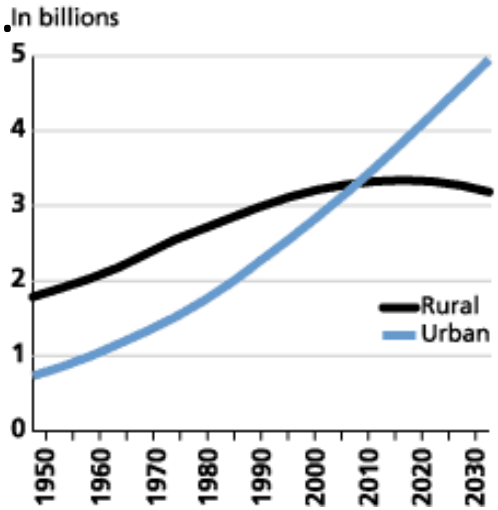
History of Urbanization

- Through most of history, the human population has lived a rural lifestyle, dependent on agriculture and hunting for survival.
- In 1800, only 3 percent of the world's population lived in urban areas.
- By 1900, almost 14 percent were urbanites, although only 12 cities had 1 million or more inhabitants.
- In 1950, 30 percent of the world's population resided in urban centers. The number of cities with over 1 million people had grown to 83.

Facts on Urbanization

- The world has experienced unprecedented urban growth in recent decades.
- In May 2007 for the first time in history over 50% of the world's population lived in urban areas.
- There are 411 cities over 1 million.

- Globally, more people live in urban areas than in rural areas, with 55 % of the world's population residing in urban areas in 2018. In 1950, 30 % of the world's population was urban.
- By 2030, it is expected that 60% of the world population will be urban, and that most urban growth will occur in less developed countries.
- By 2050, 68 % of the world's population is projected to be urban.



- More developed nations are about 76 percent urban, while 40 percent of residents of less developed countries live in urban areas.

- Today, the most urbanized regions include Northern America (with 82 % of its population living in urban areas in 2018), Latin America and the Caribbean (81 %), Europe (74 %) and Oceania (68%). The level of urbanization in Asia is now approximating 50 %. In contrast, Africa remains mostly rural, with 43 % of its population living in urban areas.

- Growth in the urban population is driven by overall population increase and by the upward shift in the percentage living in urban areas. Together, these two factors are projected to add 2.5 billion to the world's urban population by 2050, with almost 90 % of this growth happening in Asia and Africa.
- Just three countries – India, China and Nigeria – together are expected to account for 35 % of the growth in the world's urban population between 2018 and 2050. India is projected to add 416 million urban dwellers, China 255 million and Nigeria 189 million.

- The urban population of the world has grown rapidly since 1950, having increased from 751 million to 4.2 billion in 2018. Asia, despite being less urbanized than most other regions today, is home to 54 % of the world's urban population, followed by Europe and Africa (13 % each).

- The rural population of the world has grown slowly since 1950 and is expected to reach its peak in a few years. The global rural population is now close to 3.4 billion and is expected to rise slightly and then decline to around 3.1 billion in 2050. Africa and Asia are home to nearly 90 % of the world's rural population. India has the largest rural population (893 million), followed by China (578 million).

Causes of urbanization

- A city grows through natural increase — the excess of births over deaths and the in-migration of people from rural areas.
- Urbanization accompanies:

  - *Modernization*- transformation from traditional, mostly agrarian societies, to contemporary bureaucratized states

  - *Industrialization*- transformation from an agricultural base and handmade goods to manufacturing industries

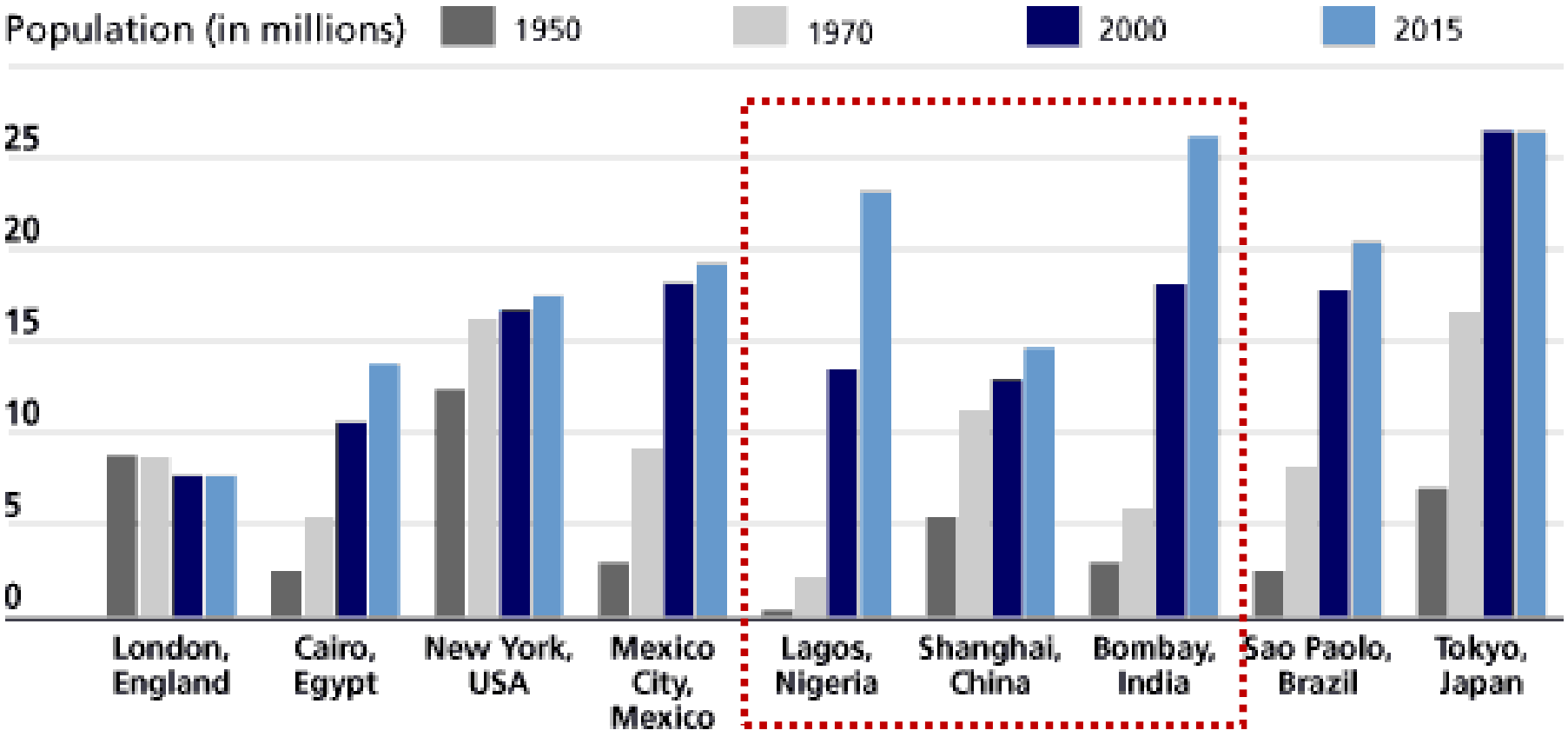
- MDCS and LDCs differ in the way in which urbanization is occurring.

- **Urbanization in MDCs :** During the 19th and early 20th centuries, urbanization resulted due to industrialization.
  - New job opportunities in the cities encouraged the mass movement of population away from the countryside.
  - At the same time, migrants provided cheap, plentiful labor for the emerging factories.
  - High death rates in the cities slowed urban growth. Cities were unhealthy places because of crowded living conditions, the prevalence of contagious diseases, and the lack of sanitation. Until the mid-1800s, the number of deaths exceeded births in many large European cities.
  - *Migration* accounted for as much as 90 percent of city growth during this period

- **Urbanization in LDCs**
  - Urbanization in most less developed countries in the past 50 years contrasts sharply with the experience of the more developed countries.
  - Death rates have fallen faster in urban areas because of greater access to health services.
  - Because birth rates are relatively high in most less developed countries, the rates of natural increase are also quite high in cities.
  - Migration also fuels urban growth in less developed countries as people leave the countryside in search of better jobs

Global differences in urbanization

- New York and London are typical of large cities in more developed countries that arose in the 1800s and early 1900s, reached their current size mid-century, and have since experienced slow growth or decline.
- Cities in some less developed countries, such as Mexico City, grew very rapidly between 1950 and 1980, and are growing more slowly now.
- Many Asian and African cities, such as Lagos and Bombay, are experiencing very rapid growth now and are projected to continue at this pace.


Population (in millions)
1950
1970
2000
2015
25
20
15
10
5
0
London, England
Cairo, Egypt
New York, USA
Mexico City, Mexico
Lagos, Nigeria
Shanghai, China
Bombay, India
Sao Paolo, Brazil
Tokyo, Japan

- Much of urban migration is driven by pull factor - rural populations' desire for the advantages that urban areas offer.
  - Urban advantages include greater opportunities to receive education, health care, and services such as entertainment. The urban poor have less opportunity for education than the urban nonpoor, but still they have more chance than rural populations.

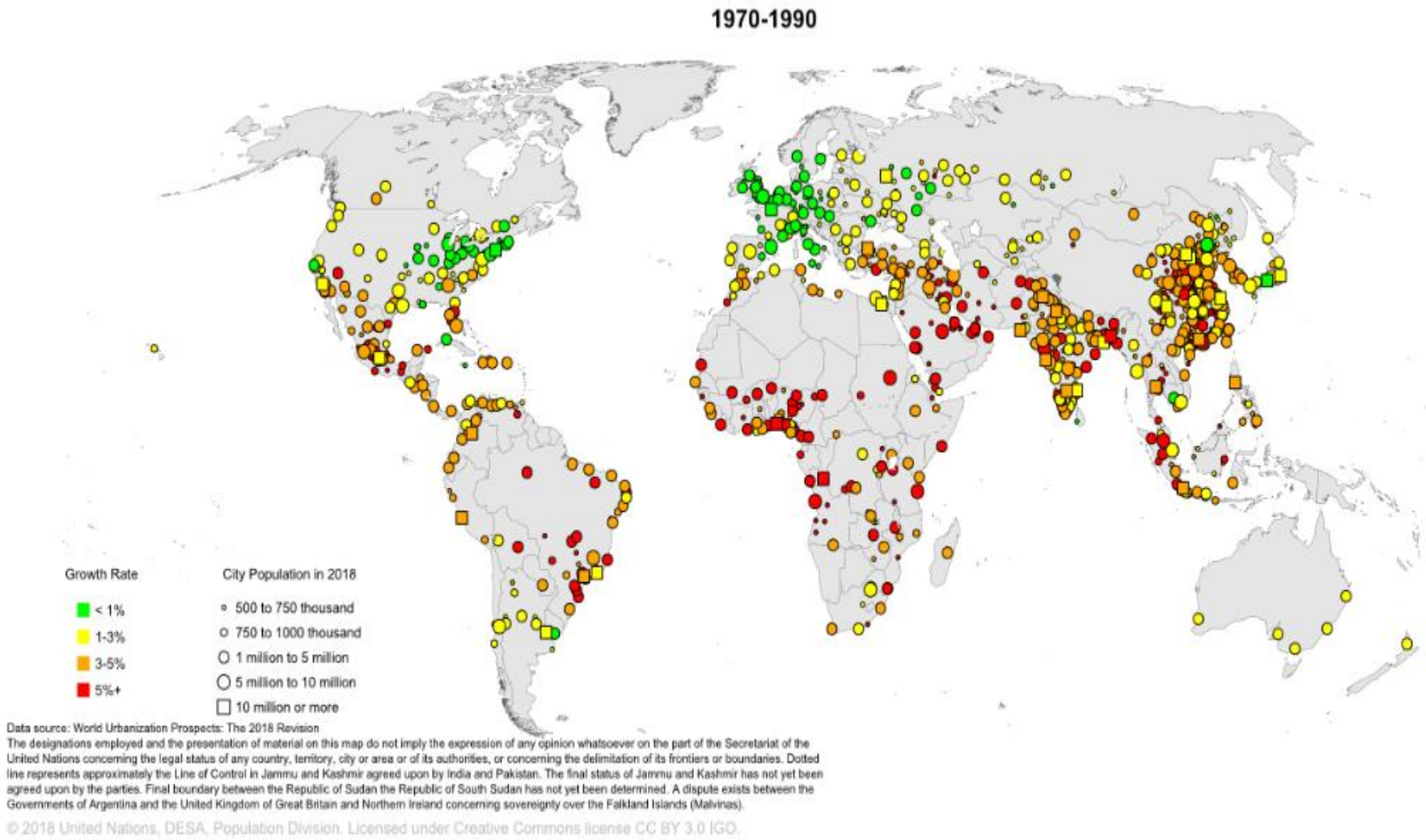
Megacities

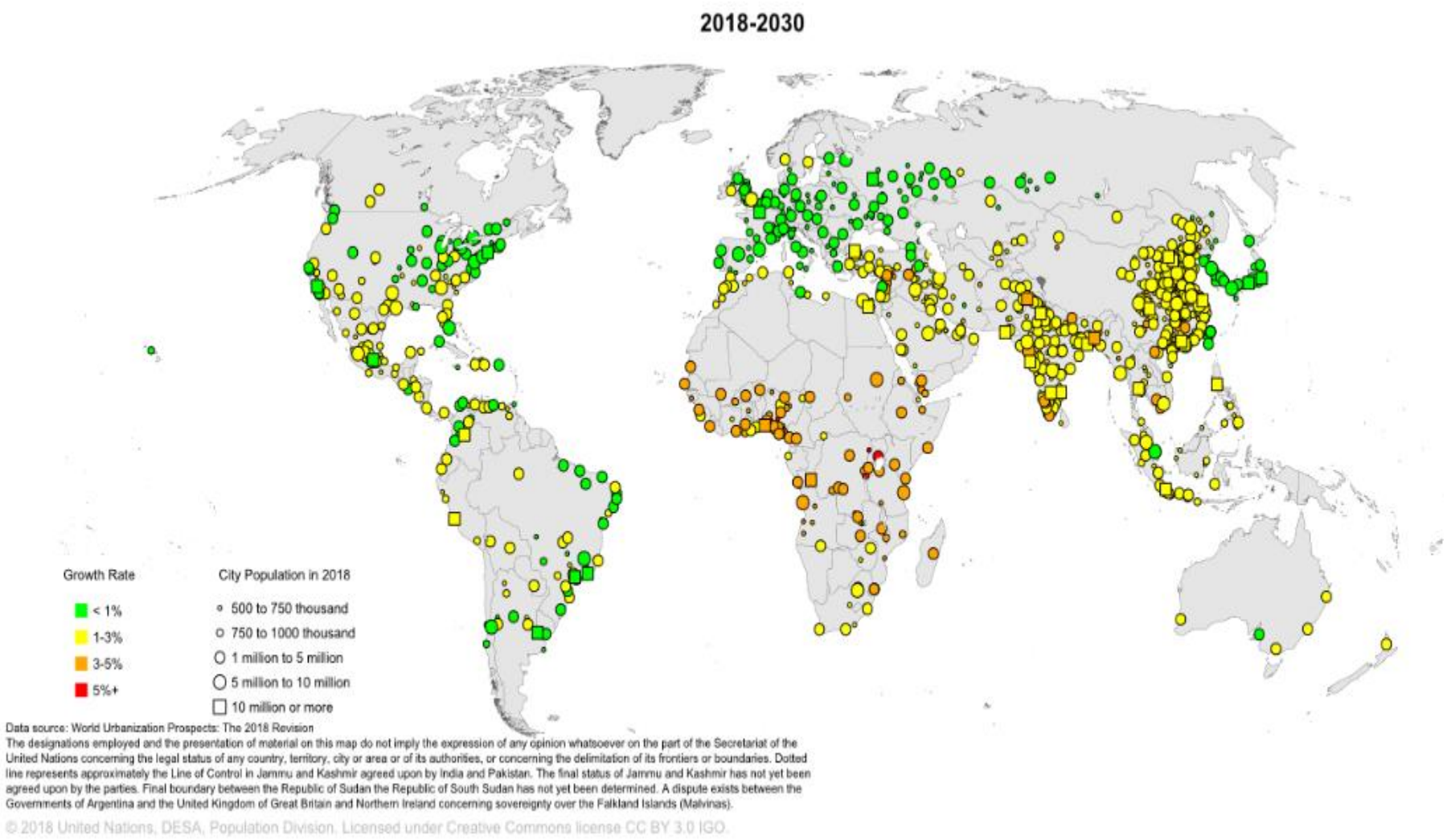
- As the population increases, more people will live in large cities. Many people will live in the growing number of cities with over 10 million habitants known as megacities. shows,
- In 1950 just eight cities had populations of 5 million or more, two of them in less developed countries.
- There were 41 megacities in 2000, and in 2015, about 59 megacities existed, while 48 were observed in less developed countries.

- Close to half of the world's urban dwellers reside in settlements with fewer than 500,000 inhabitants, while around one in eight live in 33 megacities with more than 10 million inhabitants. By 2030, the world is projected to have 43 megacities, most of them in developing regions.

- Tokyo is the world's largest city with an agglomeration of 37 million inhabitants, followed by Delhi with 29 million, Shanghai with 26 million, and Mexico City and São Paulo, each with around 22 million inhabitants. Today, Cairo, Mumbai, Beijing and Dhaka all have close to 20 million inhabitants.

- Some cities have experienced population decline in recent years. Most of these are located in the low-fertility countries of Asia and Europe where overall population sizes are stagnant or declining. Economic contraction and natural disasters have contributed to population losses in some cities as well.





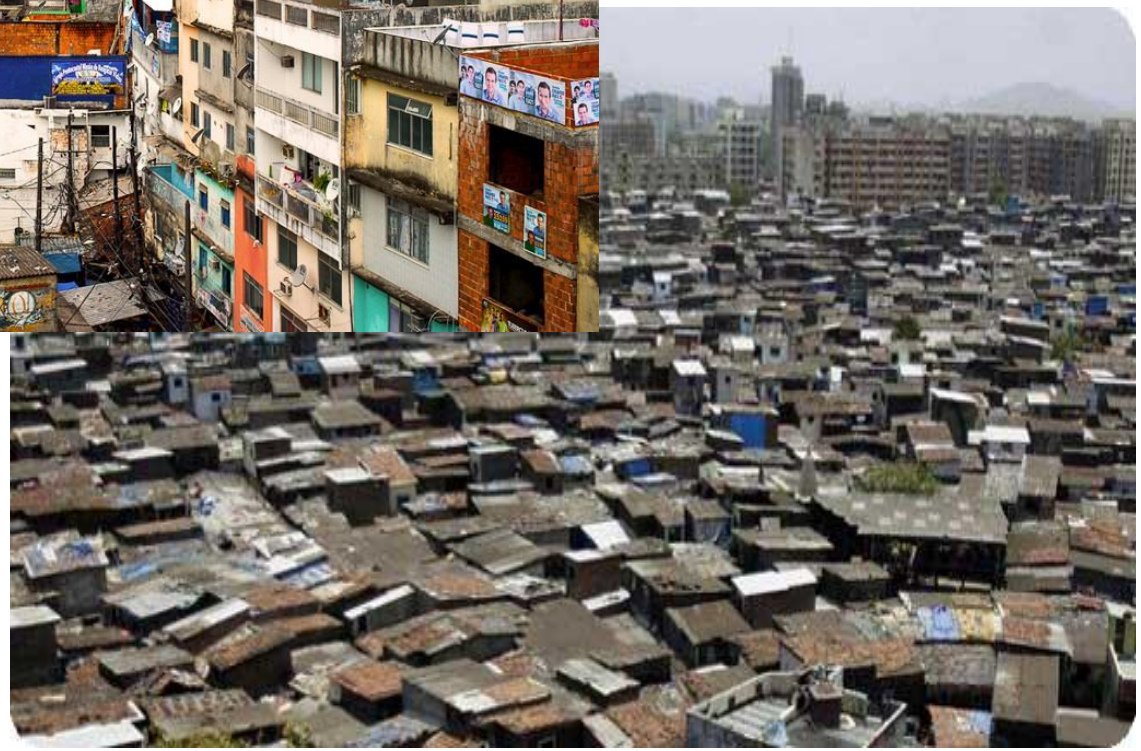
Suburbanization

- As more and more people moved to the **suburbs,** urban areas surrounding central cities -**suburban sprawl**.

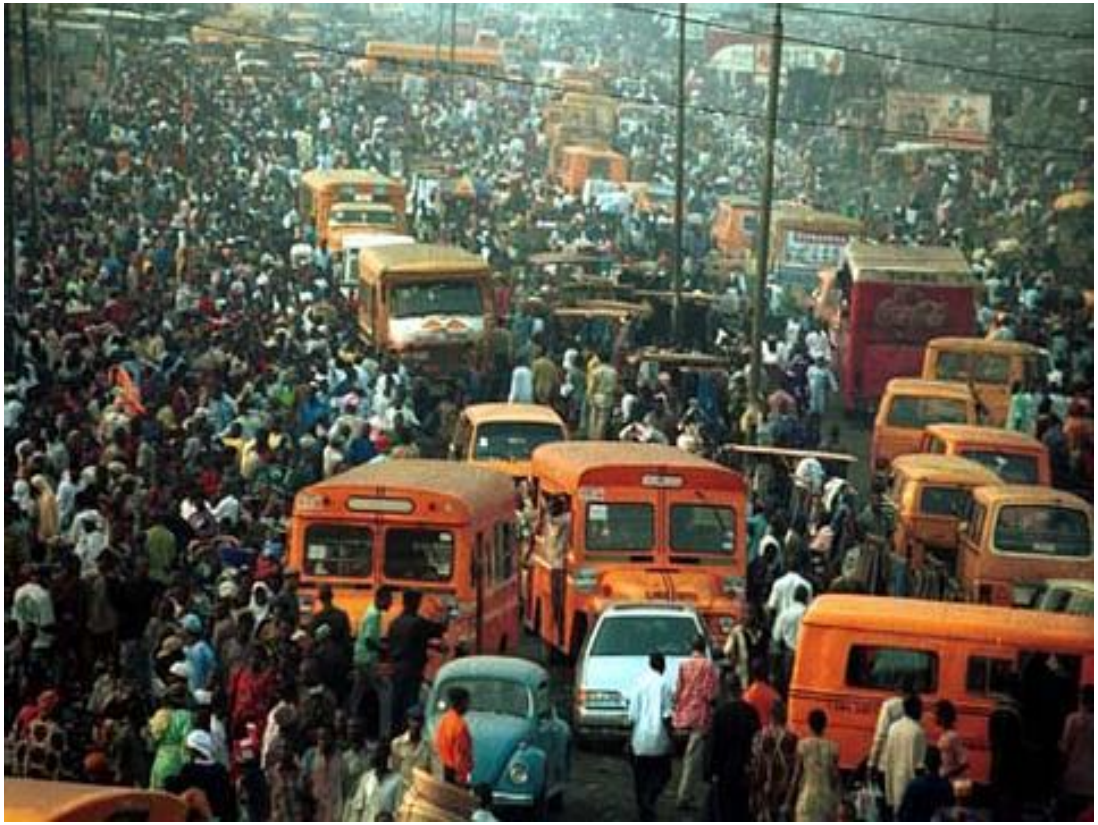
- As city residents left the city to live in the suburbs, cities experienced **deconcentration**, the redistribution of the population from cities to suburbs and surrounding areas.

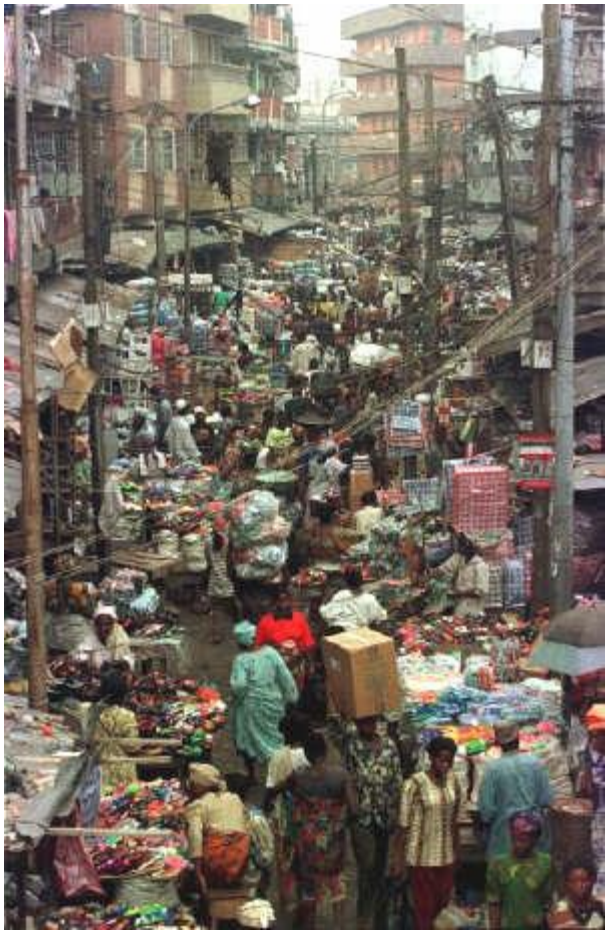
When we think ‘urban’, we tend to imagine this

Instead of this…



Or this…





Urbanization and the Environment

- The growth in world population has an important human-environmental interaction: While the world's population is doubling, the world's urban population is tripling.
- Both the increase in and the redistribution of the world population are likely to affect the natural systems of the earth and the interactions between the urban environments and populations.

- Urban populations interact with their environment. The impact that each person makes on the environment, their **environmental footprint,** is determined by their culture's patterns of consumption, consumption of food, energy, water, and land. And in turn, the polluted urban environment affects the health and quality of life of the urban population.
- People who live in urban areas have very different consumption patterns than residents in rural areas.
  - For example, urban populations consume much more food, energy, and durable goods than rural populations. In China during the 1970s, the urban populations consumed more than twice as much pork as the rural populations who were raising the pigs.
  - In India where many urban residents are vegetarians, greater prosperity is seen in higher consumption of milk.

- Urban populations not only consume more food, but they also consume more durable goods. In the early 1990s, Chinese households in urban areas were two times more likely to have a TV, eight times more likely to have a washing machine, and 25 times more likely to have a refrigerator than rural.
- Energy consumption for electricity, transportation, cooking, and heating is much higher in urban areas than in rural villages. For example, urban populations have many more cars than rural populations per capita.
- In China the per capita consumption of coal in towns and cities is over three times the consumption in rural areas.

Natural capital (inputs)

- Energy (fuel)
- Clean water
- Clean air
- Food
- Raw and refined materials for construction and industry
- Business and consumer products

Products and wastes (outputs)

- Waste heat, greenhouse gases
- Waste water, water pollution
- Air pollution
- Solid waste
- Goods, services

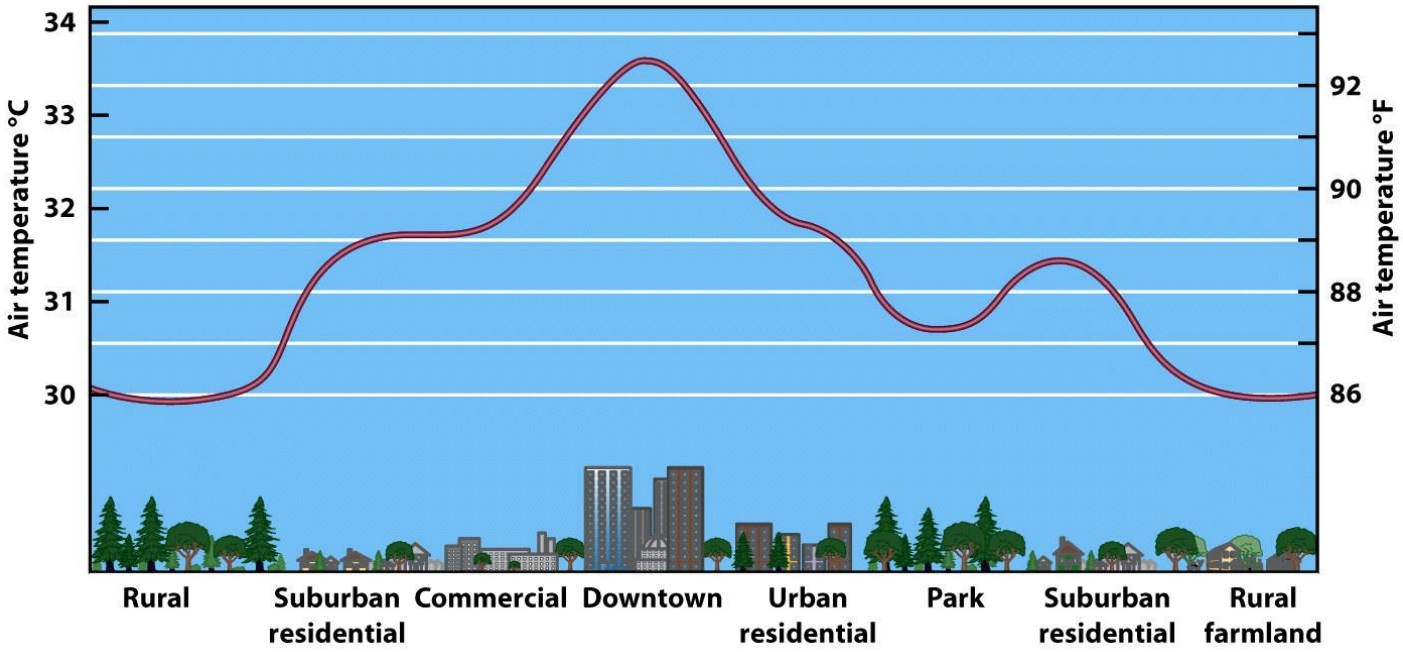
Environmental Problems in Urban Areas

- Long commutes
  - Traffic congested streets
  - Buildup of airborne emissions due to cars and industry
- Noise pollution
- Urban heat island
  - Local heat buildup in an area of high population density
  - Affect local air currents and weather conditions
  - Contribute to buildup of pollutants- dust domes

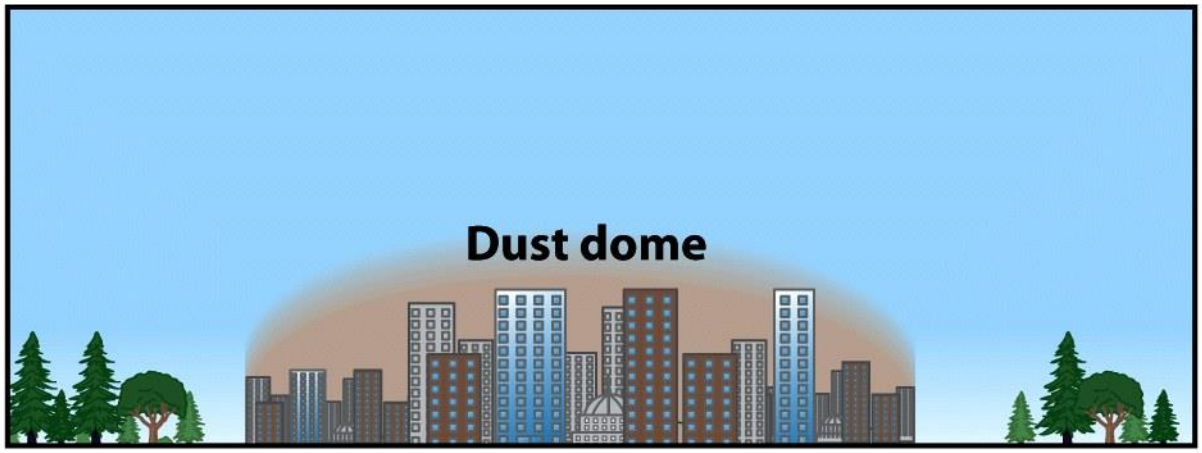
Effects on Weather- Urban Heat Island

- Urban consumption of energy helps create heat islands that can change local weather patterns and weather downwind from the heat islands.
- An **urban heat island** (**UHI**) is an urban area or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities. The temperature difference usually is larger at night than during the day, and is most apparent when winds are weak.
- The combination of the increased energy consumption and difference in radiation means that cities are warmer than rural areas (0.6 to 1.3 C)
- And these heat islands become traps for atmospheric pollutants. Cloudiness and fog occur with greater frequency.
- Precipitation is 5 percent to 10 percent higher in cities; thunderstorms and hailstorms are much more frequent, but snow days in cities are less common.

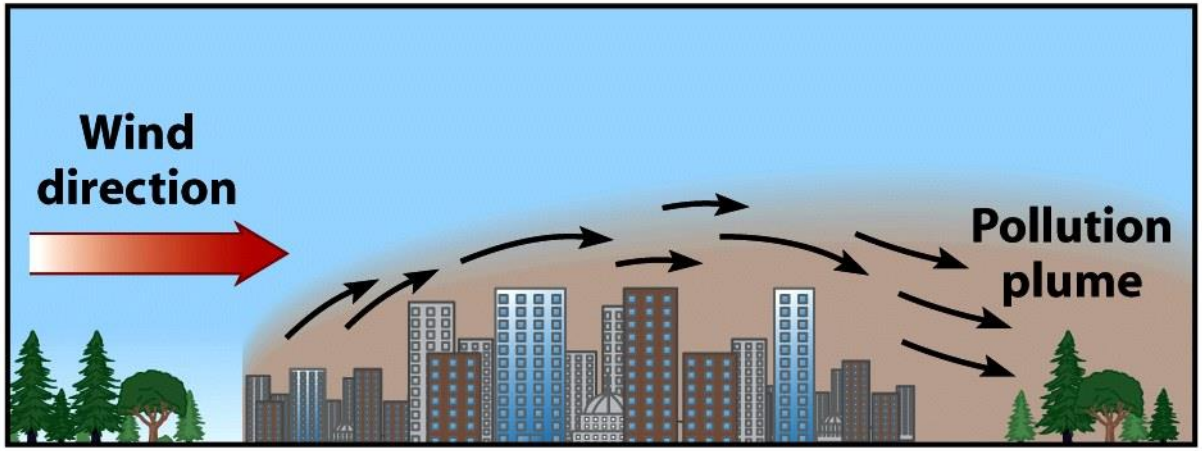
Urban Heat Island



Temperature variations on a summer afternoon



(a) A dust dome of pollutants forms over a city when the air is somewhat calm and stable.



(b) When wind speeds increase, the pollutants move downwind from the city.

There are several causes of an urban heat island (UHI); for example,

- Dark surfaces absorb significantly more solar radiation, which causes urban concentrations of roads and buildings to heat more than suburban and rural areas during the day.
- Materials commonly used in urban areas for pavement and roofs, such as concrete and asphalt, have significantly different thermal bulk properties (including heat capacity and thermal conductivity) and surface radiative properties than the surrounding rural areas. This causes a change in the energy budget of the urban area, often leading to higher temperatures than surrounding rural areas.
- Lack of evapotranspiration (for example, through lack of vegetation) in urban areas. The U.S. Forest Service found in 2018 that cities in the United States are losing 36 million trees each year. With a decreased amount of vegetation, cities also lose the shade and cooling effect of trees, and the removal of carbon dioxide.

Urban air pollution kills more than 5,000 people per year in France

http://www.zapworld.com/about/news/watch_francepollution.asp

Urban Housing Problems

- **Slums** are concentrated areas of poor housing and squalor in heavily populated urban areas.

- Nearly one in three city dwellers worldwide live in slums characterized by overcrowding, little employment, and poor water, sanitation, and health care services.

Urbanization and Health

- Some urban environmental problems include inadequate water and sanitation, lack of rubbish disposal, and industrial pollution.
- The health implications of these environmental problems include respiratory infections and other infectious and parasitic diseases.
- In addition, a study of 85 U.S. urban areas found that in 2003 traffic congestion caused 3.7 billion hours of traffic delay and wasted 2.3 billion gallons of fuel. The average annual delay per traveler increased from 16 hours in 1982 to 40 hours in 1993 and 47 hours in 2003.
- Many public roads in urban areas are afflicted with what some call **autosclerosis** clogged vehicular arteries that slow rush hour traffic to a crawl or a stop, even when there are no accidents or construction crews ahead.

Urban problems, the environment, and social policy: Macro-level perspectives

- Rural migrants and overcrowding
- Environment, infrastructure, and urban ecosystems
- Health
- Poverty (urban poor)
- Crime and delinquency

Making Cities More Sustainable

Urban growth is closely related to the three dimensions of sustainable development: economic, social and environmental. Policies to manage urban growth need to ensure access to infrastructure and social services for all, focusing on the needs of the urban poor and other vulnerable groups for housing, education, health care, decent work and a safe environment.

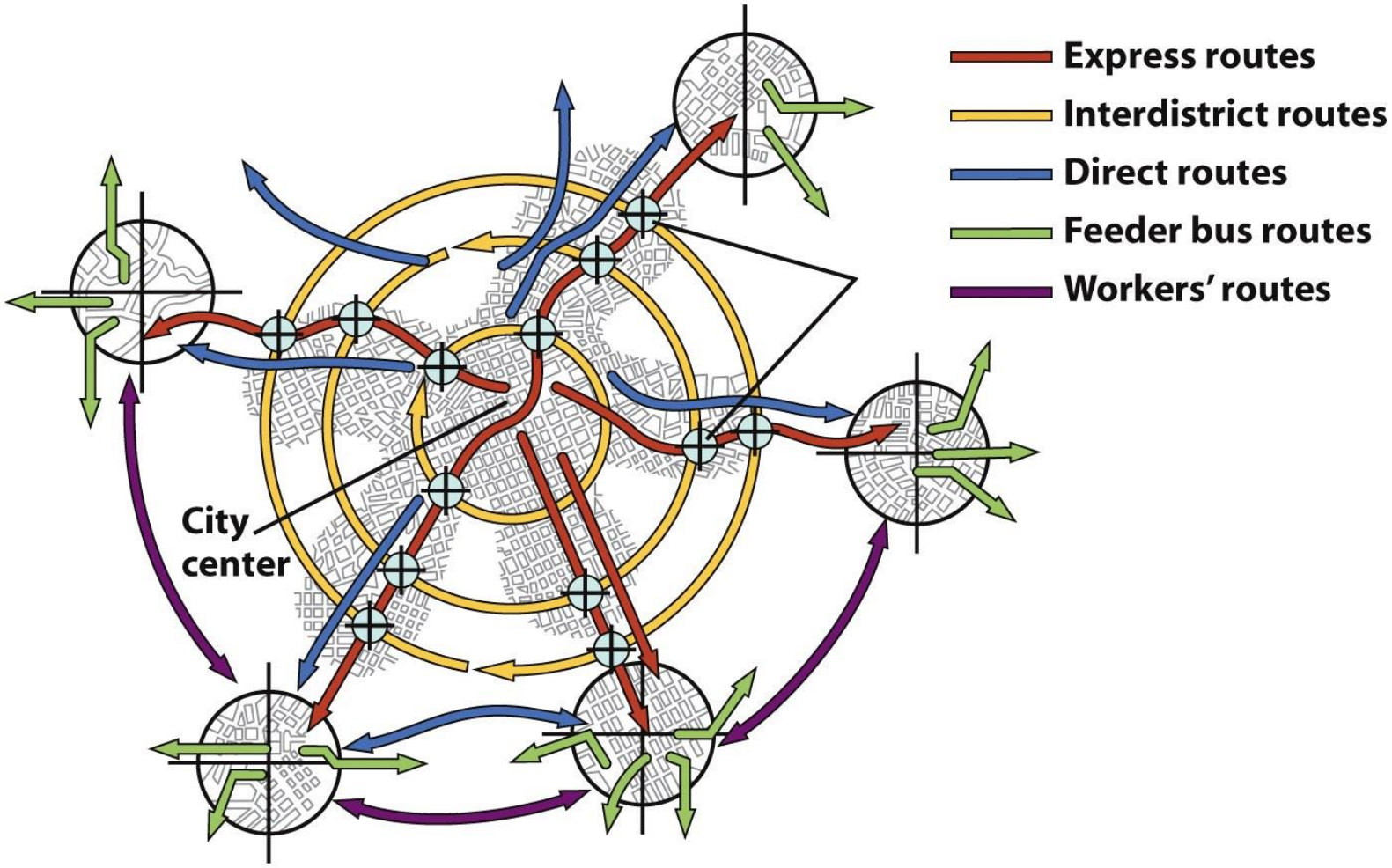
- Characteristics of a sustainable urban city
  - Clear, cohesive urban growth policies
  - Efficient use of energy and other resources
  - Reduction of pollution and waste
    - Reuse and recycle materials in waste stream
  - Large areas of green space
  - Designed to be people-centers, not car-centered
  - Food grown IN the city (rooftop gardens)
  - Compact development

Environmental Benefits of Urbanization

- Well-planned city can benefit the environment
  - Reduces pollution
  - Preserves rural areas
- Compact Development
  - Design of cities where residential buildings are close to shopping, jobs and public transportation
  - Ex: Portland, Oregon
- From center of city outwards:
  - City center- Central Business District (highest taxes)
  - Residential properties (lower taxes than city center)
  - Land intensive businesses (even lower taxes)
  - Suburbs (lowest taxes)
- Parks and green space are interspersed

Copenhagen, Denmark
A People-centered City

Sustainable Cities
Case in Point- Curitiba, Brazil



Strategies for Reducing Urban Growth in Developing Countries

1. Promoting agricultural development in rural areas.
2. Providing incentives to industries and businesses to relocate from urban to rural areas.
3. Providing incentives to encourage new businesses in rural areas.
4. Developing the infrastructure of rural areas, including transportation systems, clean water supplies, sanitary waste disposal systems, and social services.

Rural: Theoretical Considerations

Complexity of rural areas

'Rural'

- Spatial definitions (urban/rural divide)
- Sectoral definitions (agriculture & traditional activities)
- Administrative definitions (OECD, NUTS)

Eurostat NUTS Classification

- **Densely populated zones** : a *population density greater than 500 inhabitants/km^2,*and a total population for the zone of at least 50,000 inhabitants.
- **Intermediate zones** : these are groups of municipalities, each with a *density greater than 100 inhabitants/km^2,*not belonging to a densely populated zone. The zone's total population must be at least 50,000 inhabitants, or it must be adjacent to a densely populated zone.
- **Sparsely populated zones** : these are groups of municipalities not classified as either densely populated or intermediate.

OECD Classification

- **predominantly rural regions** : over 50% of the population living in rural communities;
- **significantly rural regions** : 15 to 50% of the population living in rural communities;
- **predominantly urban regions** : less than 15% of the population living in rural communities.

Also, according to their degree of integration with the national economy, rural areas can further be distinguished as:

- Integrated rural area
- Intermediate rural area
- Remote rural areas

Concept of Rural

‘Rural’ means an area which is marked by non-urban style of life, occupational structure, social organization and settlement pattern with low population density.

Rural is noticeably agricultural, its settlement system consists of villages or homesteads ; Socially it signifies greater inter dependence among people, more deeply rooted community lifeand a slow moving rhythm of life built around nature and natural phenomenon; and occupationally it is highly dependent on crop farming, animal enterprises, tree crops andrelated activities.

Rural Development

- The concept of rural development was borne in the context of agriculture and it encompassed agricultural development
- Since 1970s, the concept has become more definite in its interpretation and it is being regarded as a design to improve the economic and social life especially, by extending benefits of development to the poorest, small farmers, tenants and landless.
- Now, rural development is not exclusively restricted to any single activity or area, it travels many or all areas which anyway affect upgrading, enlisting and petrifying improvement of transformation in socio-economic lives of rural people.

Rural Development = an integrated development of the area and the people through optimum development and utilization of local resources-physical, social and economic conditions and by bringing about necessary institutional, structural, and attitudinal changes of rural public.

It means overall improvement of the quality of life for rural people. It is about reduction of poverty, increasing productivity, providing basic services like health, education, drinking water, sanitation, extending infrastructure, attempt to reverse distorted land distribution and ownership and host of other aspects redressing inequality, exploitation and deprivation in any conceivable sense.

Key objectives of rural development

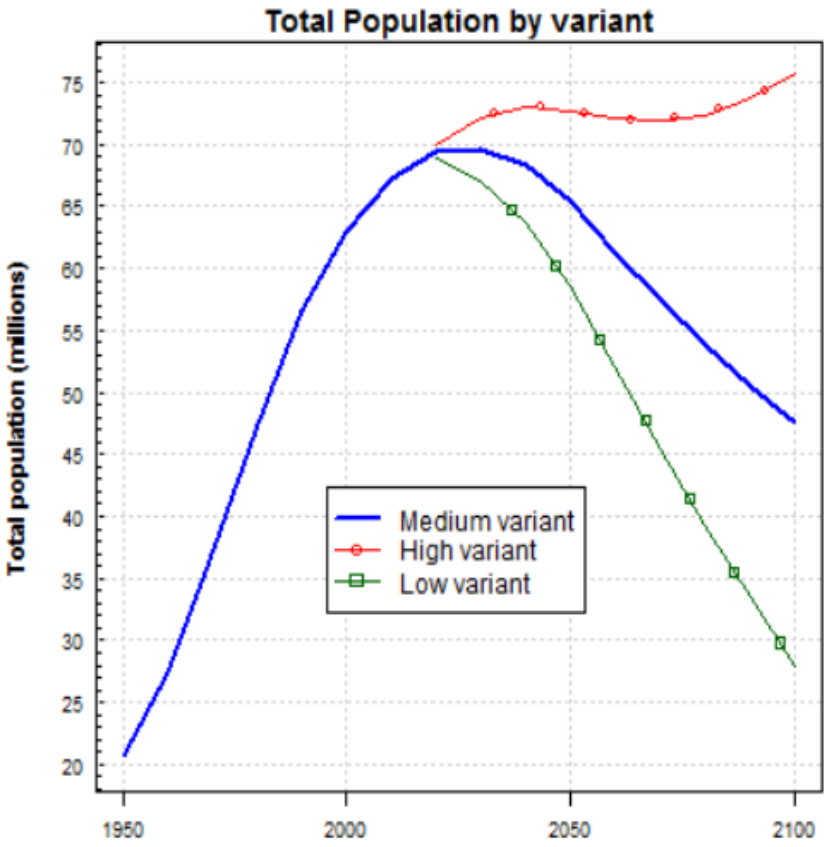
- Increasing living standards, and impact positively on quality of life
- Expanding the range of economic and social choices available to individuals.
- Reducing inequality and exclusion.

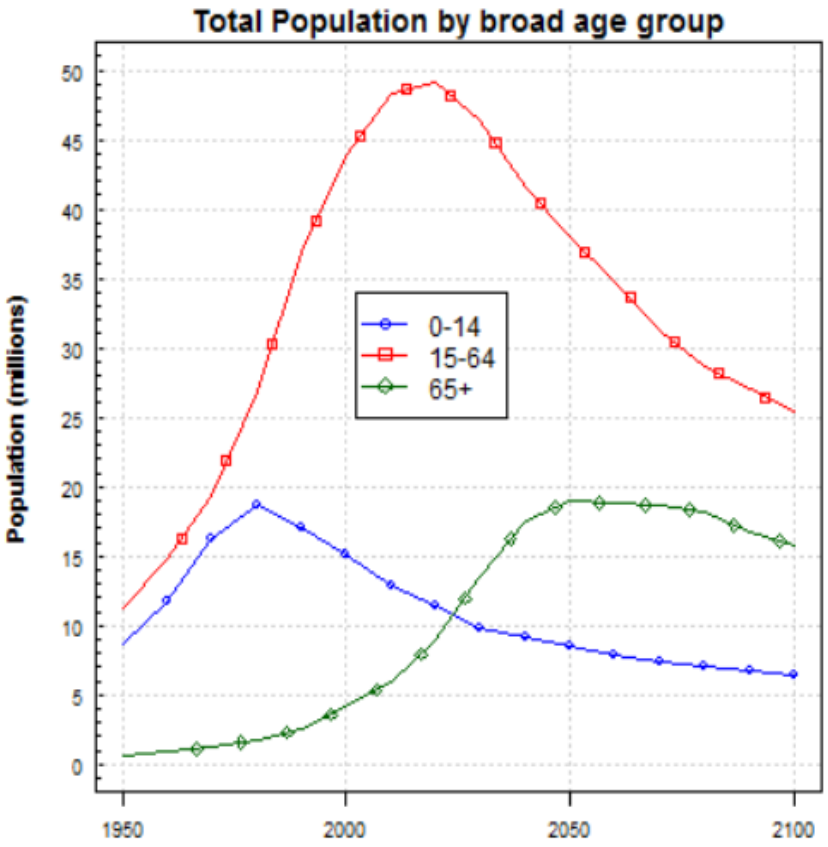
  -emphasis on the rural poor.

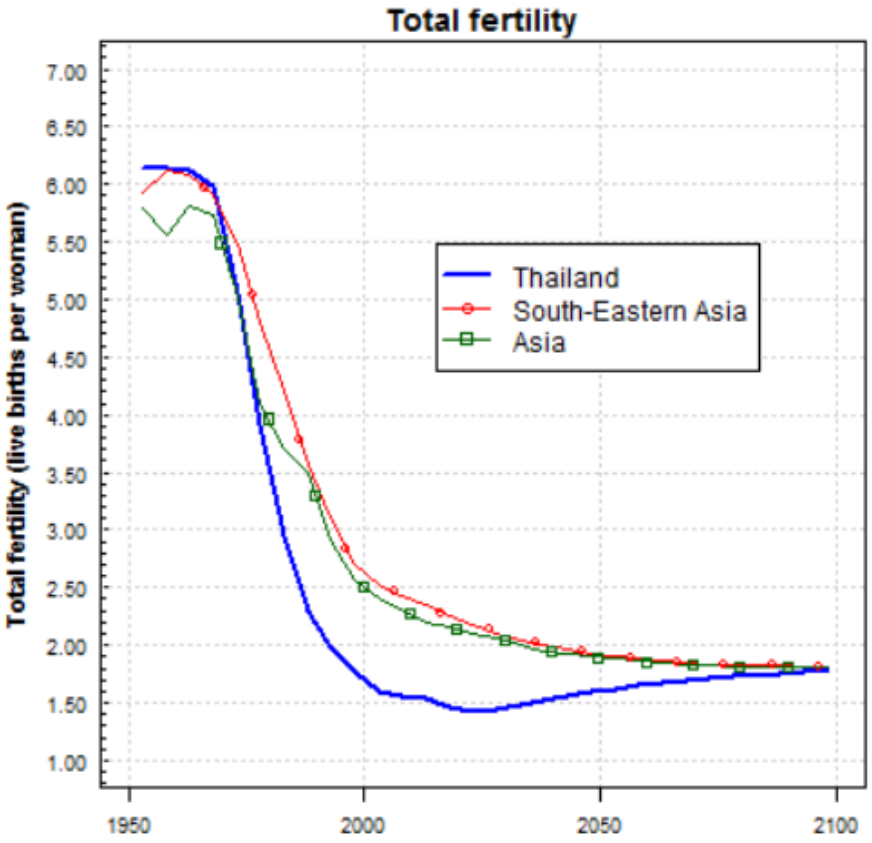
Local-level planning is a tool to translate these objectives into concrete programmes in a local area. The efficacy of local-level planning for rural development will depend on the extent of decentralization of decision-making, planning, administration and budgeting to the local level.

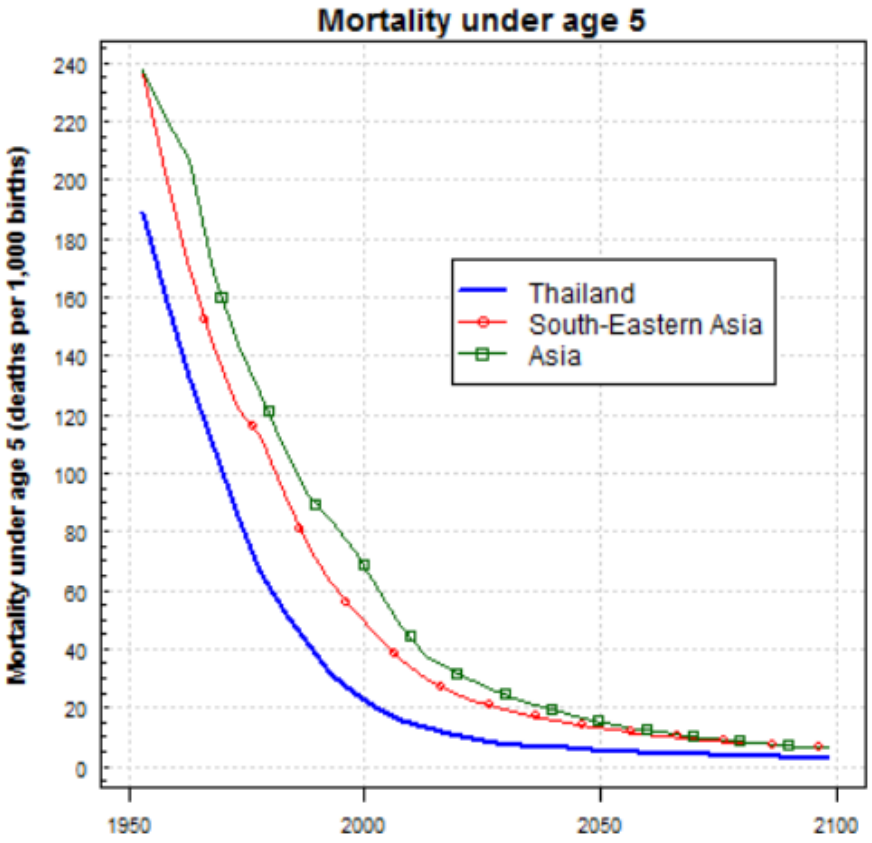
	Urban	Rural
Occupation	Wide range of professional activities Capital, technological intensive	Dominantly related agriculture activities Labor intensive –manual work
Population density	Thickly populated – 1,000 or more High population density	Sparse Small community size Low population density
Nature of relation	Formal and reciprocal	Informal, based on sincerity and one-sided merit
Environment	Human control over nature Industrial relations More polluted environment	Close contacts with nature More influence by natural phenomenon
Social mobility	Changing, based upon education, financial conditions, technology and industry.	Rarely found, satisfied with their social conditions

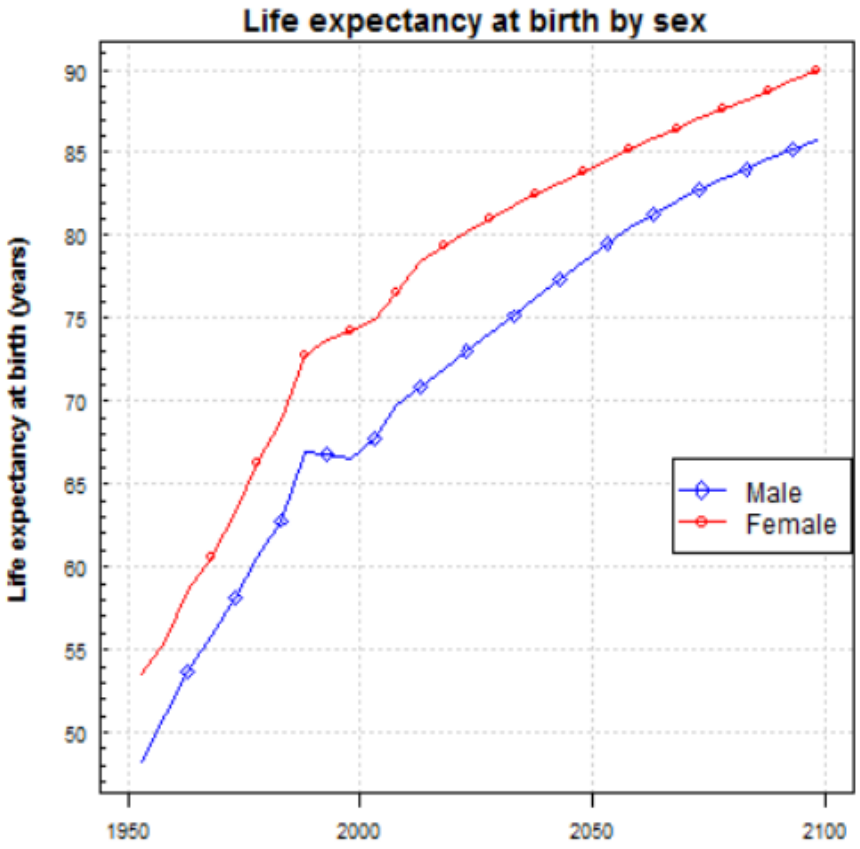
Thailand's population and age structure

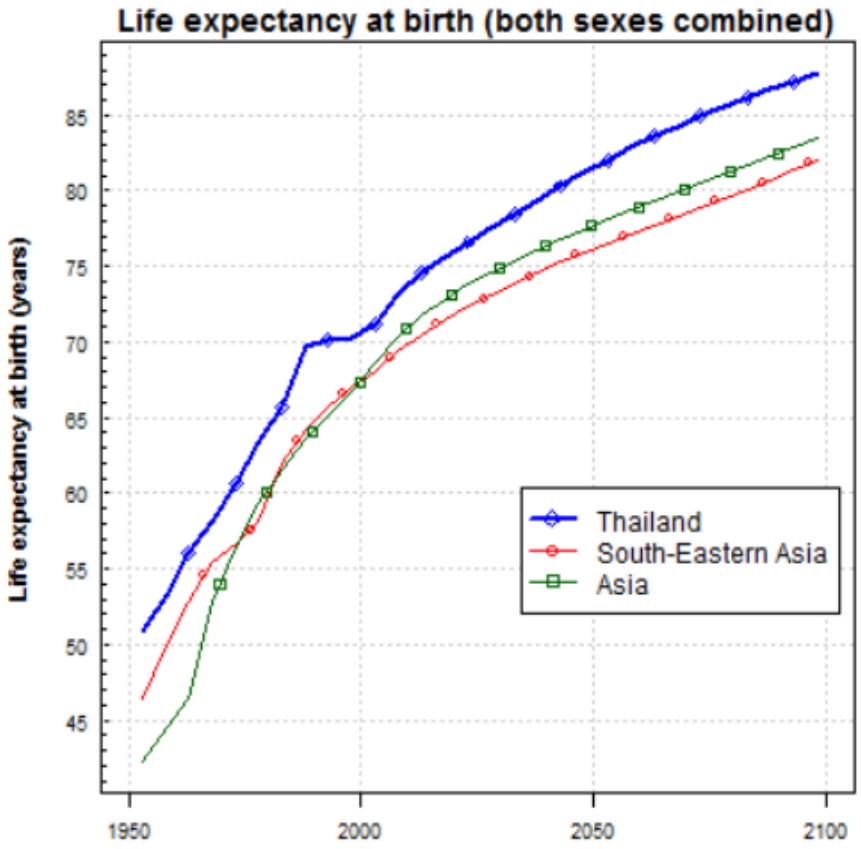




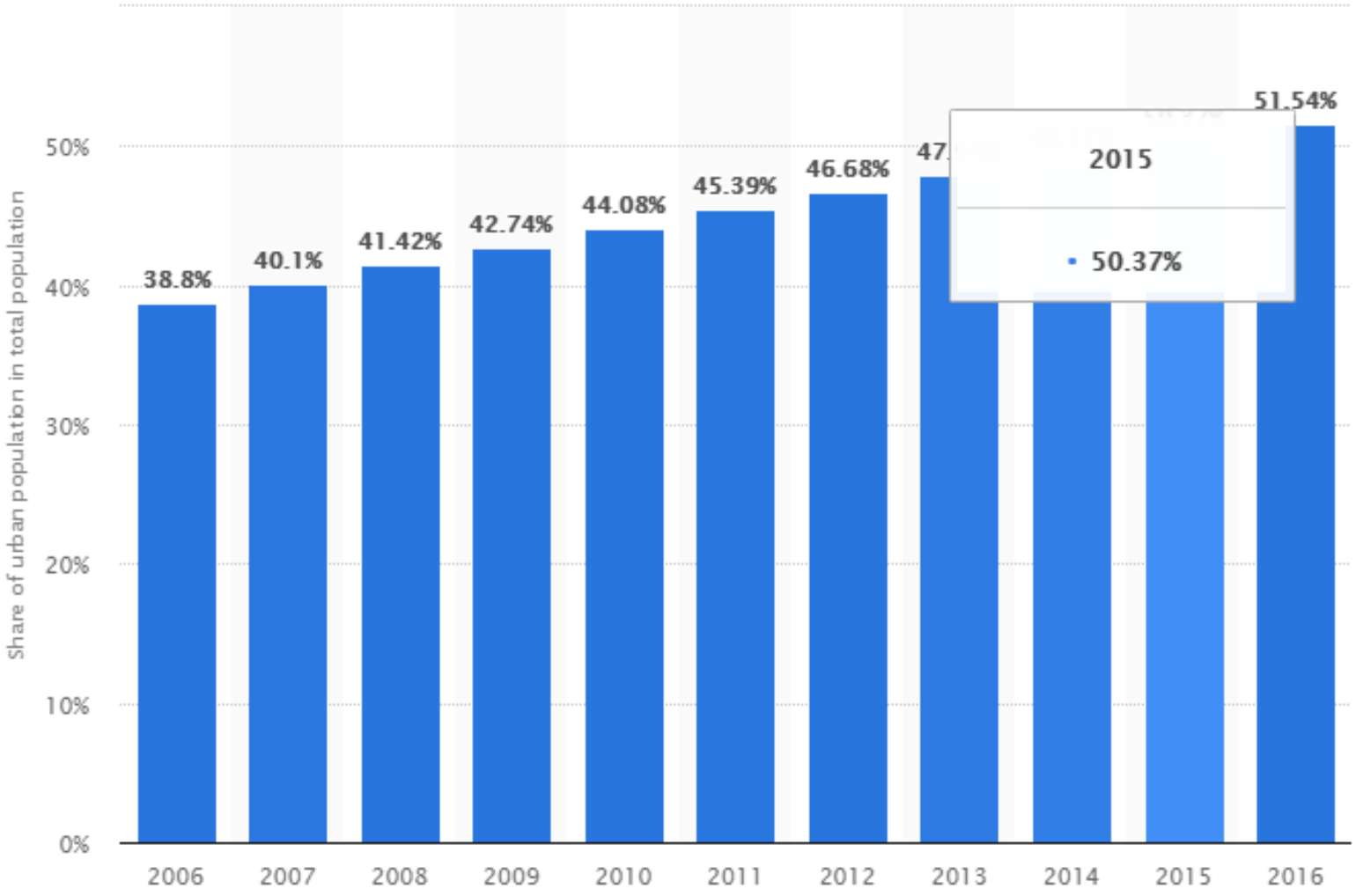

Total fertility
Total fertility (live births per woman)
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
1950
2000
2050
2100
Thailand
South-Eastern Asia
Asia


Mortality under age 5
Mortality under age 5 (deaths per 1,000 births)
240
220
200
180
160
140
120
100
80
60
40
20
0
1950
2000
2050
2100
Thailand
South-Eastern Asia
Asia

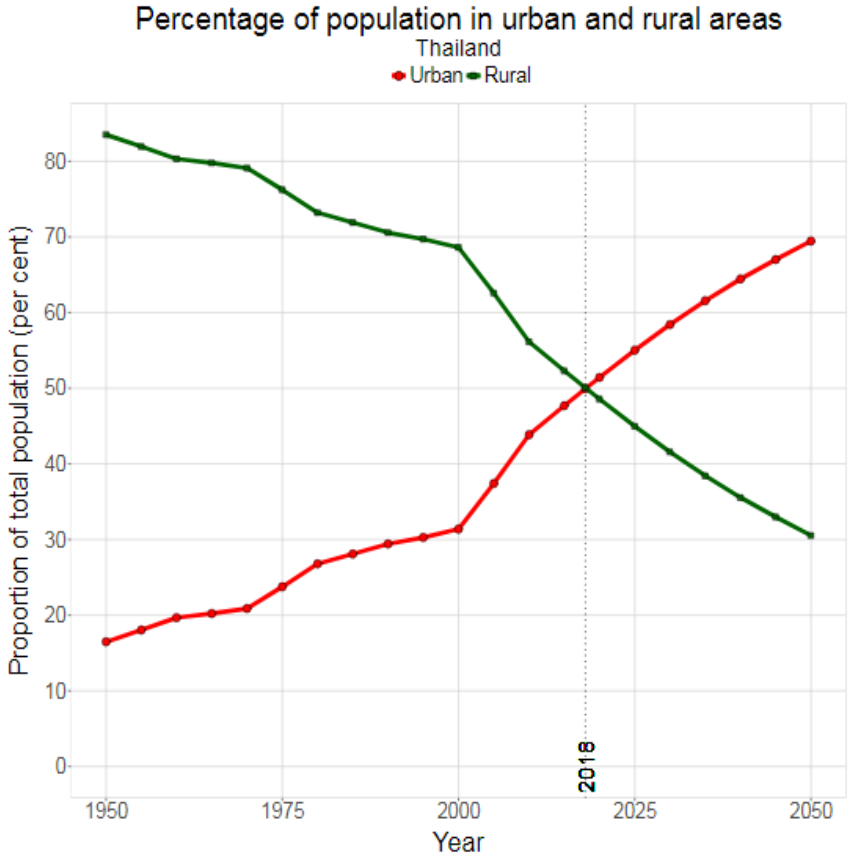

Life expectancy at birth by sex
Life expectancy at birth (years)
90
85
80
75
70
65
60
55
50
1950
2000
2050
2100
Male
Female


Life expectancy at birth (both sexes combined)
Life expectancy at birth (years)
85
80
75
70
65
60
55
50
45
1950
2000
2050
2100
Thailand
South-Eastern Asia
Asia

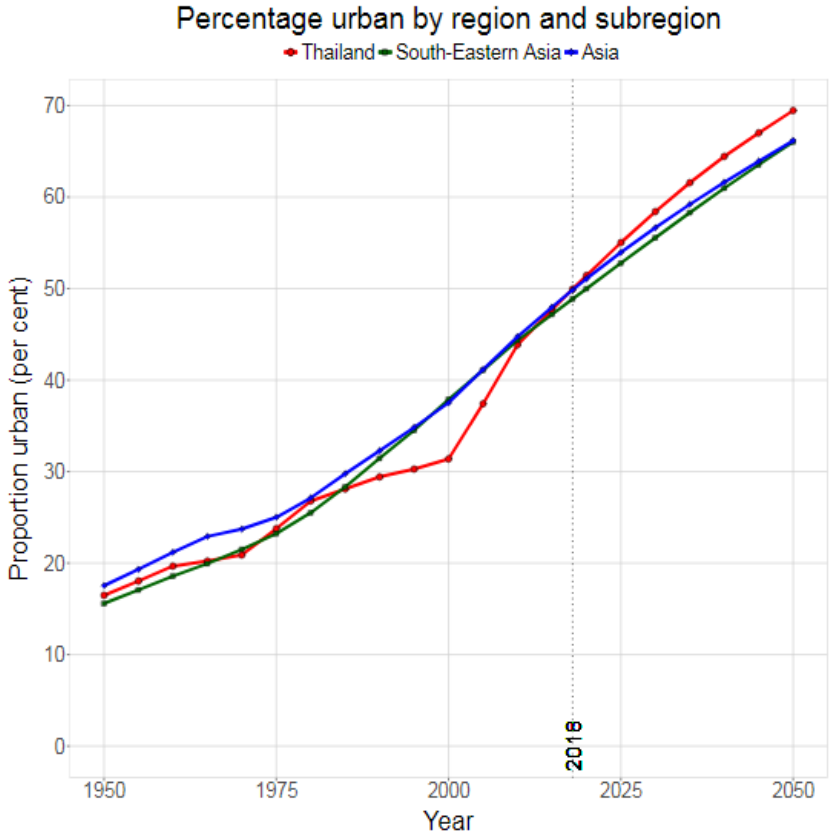
Thailand’s rate of urbanization from 2006 to 2016



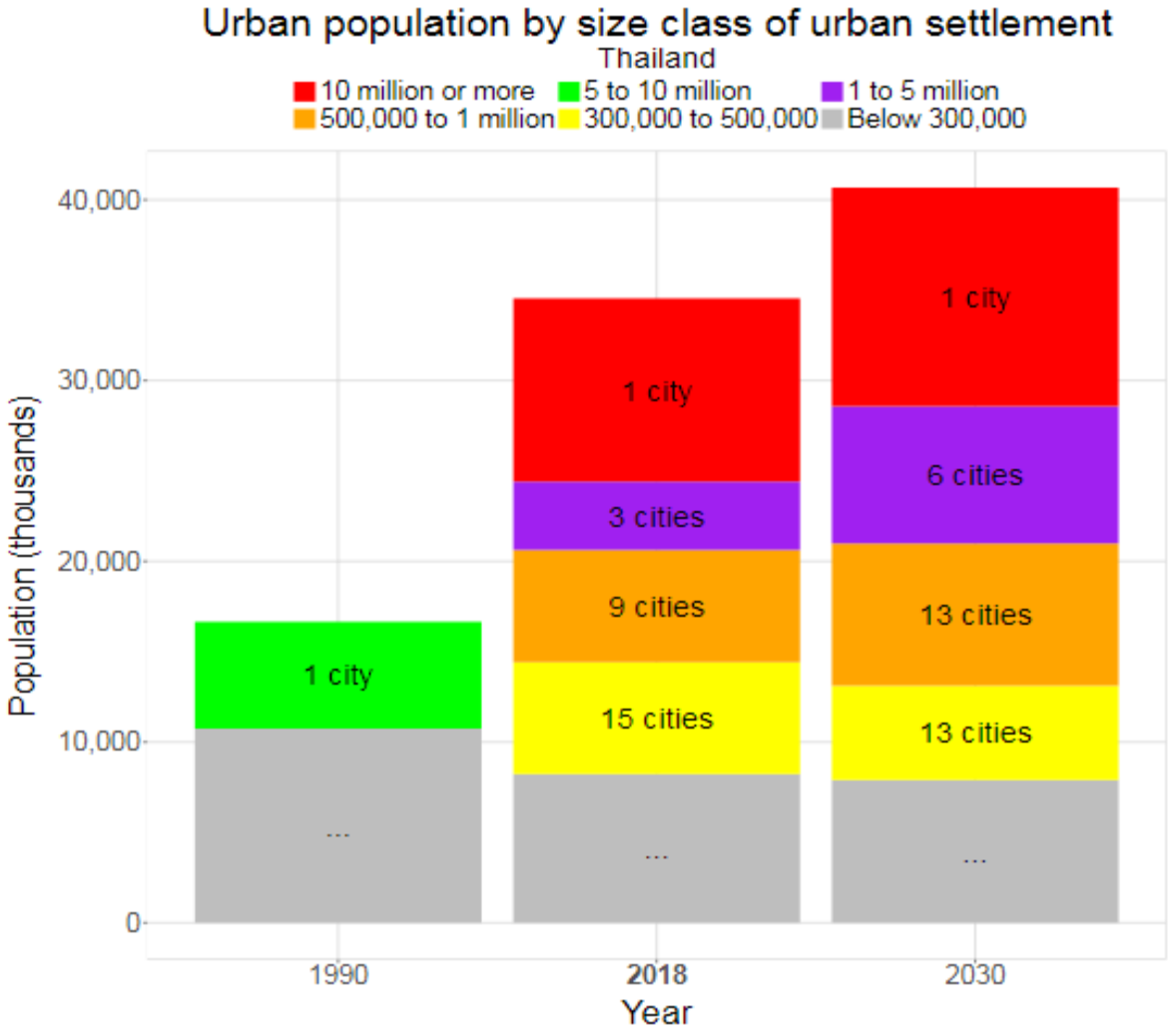
Thailand's urbanization trend



Note: Urban and rural population in the current country or area as a percentage of the total population, 1950 to 2050.

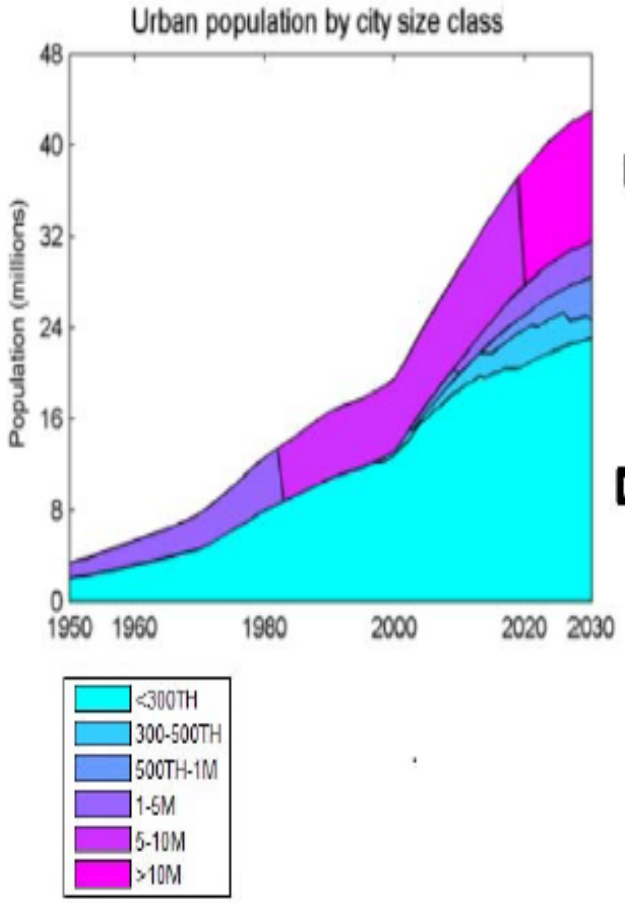


Note: Proportion of urban population in the current country as compared to its subregion and region. The proportion is expressed as a percentage of the total population, 1950 to 2050.



Note: Urban population by size class of urban settlement and number of cities, 1990, 2018 and 2030. The grey area is a residual category that includes all urban settlements with a population of less than 300,000 inhabitants.

Mega and Small Cities

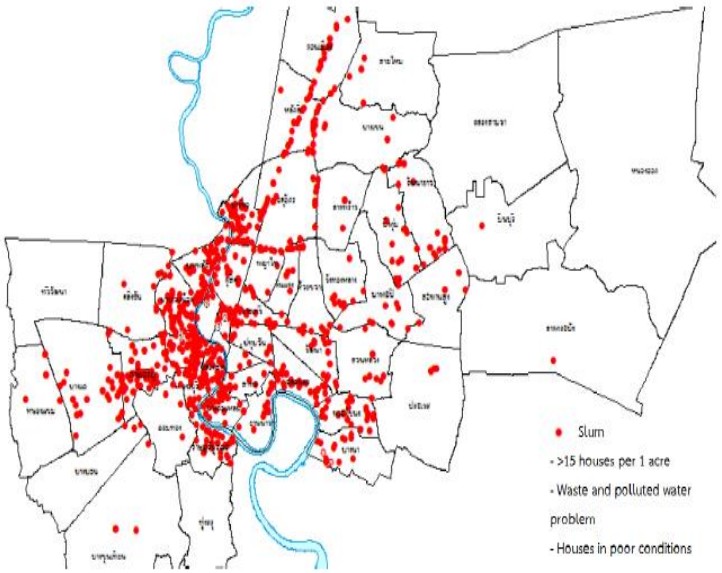


Issues for big cities
- Mega city (Bangkok)
- Major cities (Chiang Mai, Udonthani, Pattaya (Chonburi) and Phuket)

Issues for small cities
- Small cities (Mae Hong Sorn, Karnchanaburi, Kalasin)

Mega cities: Key Challenges

- Traffic congestion –traffic index put Thailand as the second most congested city in the world.
- Education and healthcare service –not so much challenges –economies of scale do work.
- Slum –wasted and polluted water problem

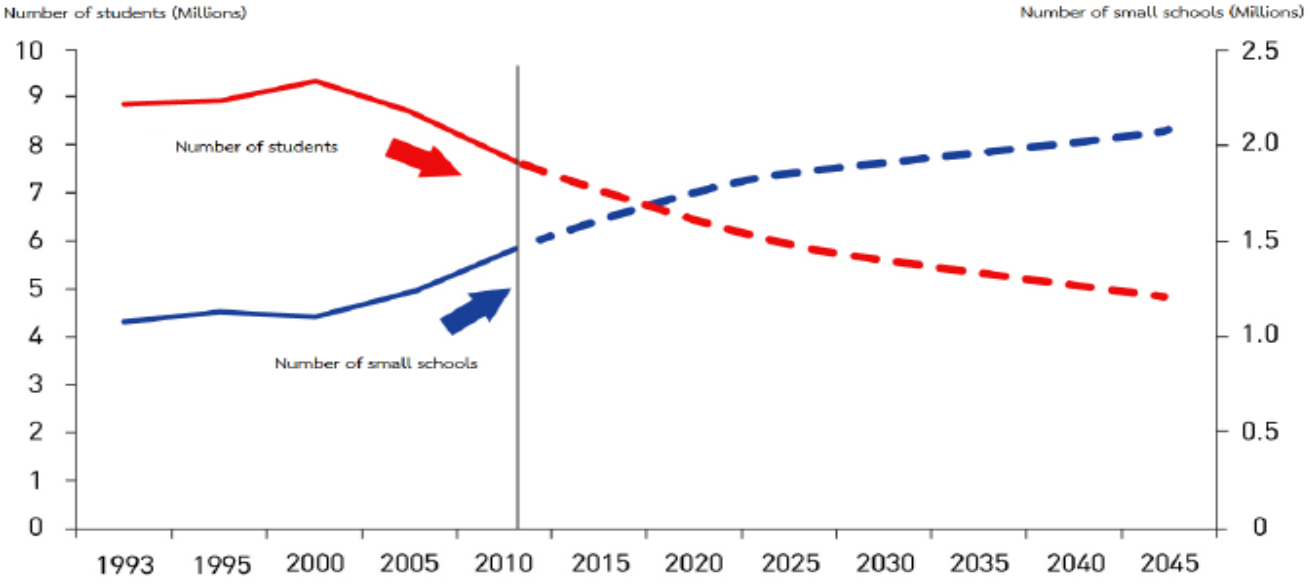


Mega cities: Way out

- City planning → Second city –infrastructure for connectivity.
- Slum relocation –to improve the scale and focus public services in particular area.
- Targeted-based policies to address urban poor and underprivileged.

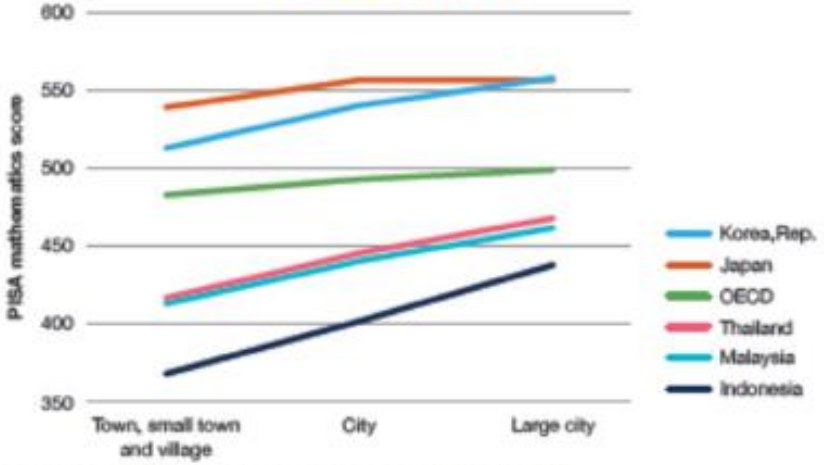
Small cities: Key Challenges

- Small population → No economies of scale → Market is not functioning → the cost of public service is high
- Public services (education, healthcare) tend to provide low quality



Source: TDRI (2016), Note: Small school = school with less than 120 students in total

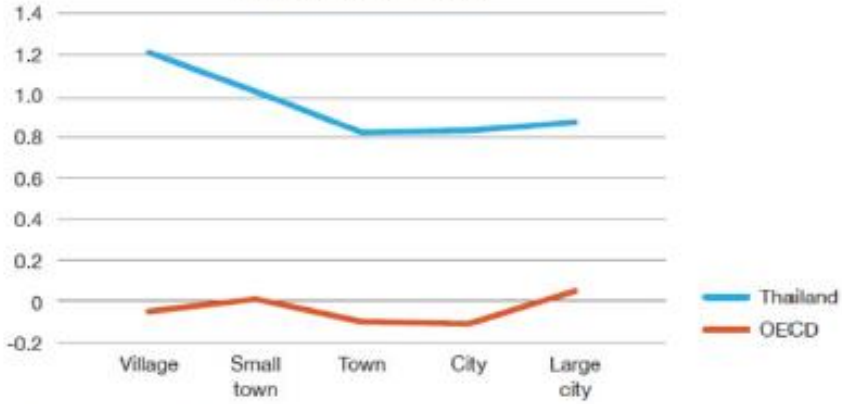
Education



Source: World Bank staff calculations based on OECD PISA 2012.

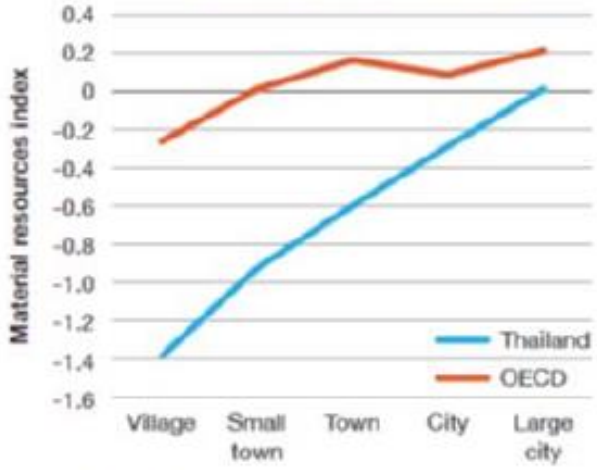
Teacher shortage

Rural-urban differences in teacher shortage index, Thailand and the OECD



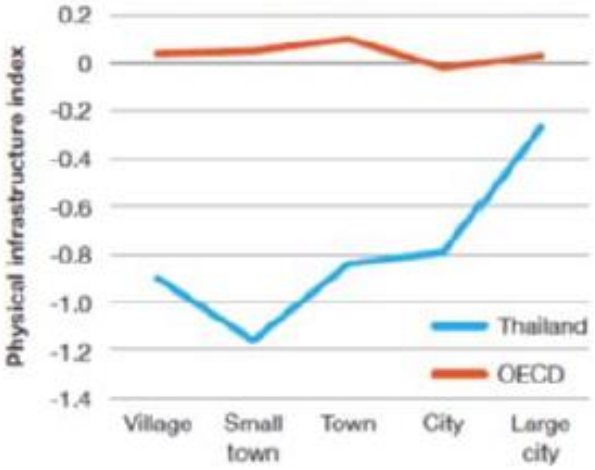
Source: OECD PISA 2012.

Rural-urban differences in quality of material resources index



Source: OECD PISA 2012.

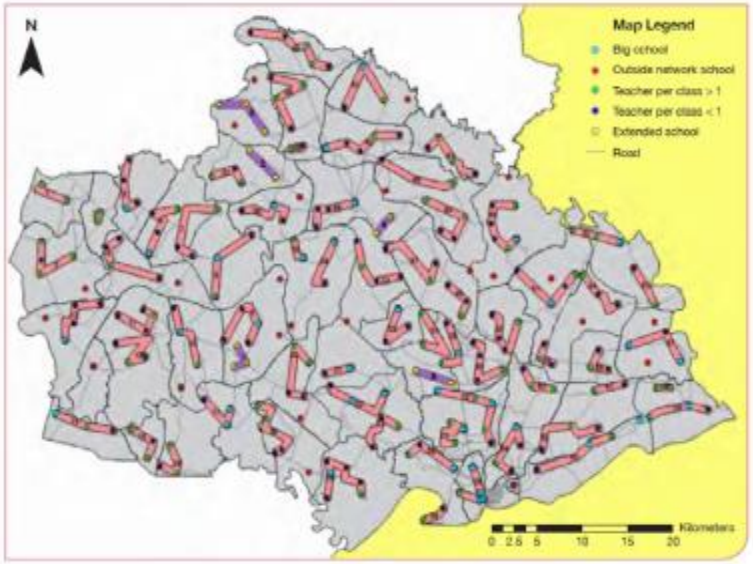
Rural-urban differences in quality of physical infrastructure index



Small cities: Way out

School closing

School networking



Source: School mapping exercise carried out for this report.

However, the implement is not easy

- Aging is one of the important trends that should be taken into account when designing policies to address urbanization.
- For Thailand, urbanization imposes pressure for both mega cities and small cities.
- For mega cities, the keys are connectivity, market-based services and specific targeted programs for the underprivileged.

Thank You