



USEFUL DEFINITIONS

– Ecological (of or relating to ecology)

- Ecology is the scientific analysis and study of interactions among organisms and their environment. It is an interdisciplinary field that includes biology, geography, and Earth science. Ecology includes the study of interactions that organisms have with each other, other organisms, and with abiotic components of their environment.

– “Ecology” *Wikipedia*. Wikipedia.org. n.p. Web. 13 August 2017

USEFUL DEFINITIONS (contd.)

– Ecological footprint

- The ecological footprint measures human demand on nature, i.e., the quantity of nature it takes to support people or an economy. It tracks this demand through an ecological accounting system. The accounts contrast the biologically productive area people use for their consumption to the biologically productive area available within a region or the world (bio-capacity). In short, it is a measure of human impact on Earth's ecosystem and reveals the dependence of the human economy on natural capital.

– “Ecological footprint” *Wordnik*. Wordnik.org. n.p. Web. 19 September 2017

USEFUL DEFINITIONS (contd.)

– Carrying capacity

- The maximum population size that the environment can sustain indefinitely without significant negative impacts to the given organism and its environment, given the food, habitat, water, sanitation, medical care and other necessities available in the environment. Waste and over-consumption, especially by wealthy people and nations, is putting more strain on the environment than overpopulation.

– “Carrying capacity” *Wikipedia*. Wikipedia.org. n.p. Web. 28 September 2017

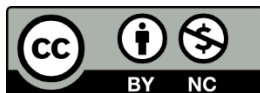
USEFUL DEFINITIONS (contd.)

– Propinquity

- One of the main factors leading to interpersonal attraction. It refers to the physical or psychological proximity between people. Propinquity can mean physical proximity, a kinship between people, or a similarity in nature between things. Propinquity happens in [public spaces](#) – on the street, in [parks](#), public transportation and [city squares](#).

– 7 Reasons Why High-Rises Kill Livability, Bloomingrock, 2017
Smart Cities Dive

Urbanization



Urbanization and Urban Growth

Why urban areas are attracting more and more people?

- About one half of the world's people live in cities/densely populated urban areas, drawn there for **better jobs** and a **better life**.
- Cities provide jobs, food, housing, a better life, entertainment, and **freedom from the religious, racial, and political conflicts of village life**.
- 3. People are pushed to cities by poverty, no land, declining work, famine, and war. Developing into **centers of poverty**.



Urban trends that affect urban growth

1. Most huge urban areas are in developing countries.
3. The number of large cities (a million or more people) is increasing rapidly.
- e. Megacities or megalopolises contain 10 million+ people.
- g. A megalopolis is a merger of a city (or cities) and adjacent urban areas;
Two such areas are Bowash (Boston–Washington) and Chipitts (Chicago–Pittsburgh).



Half of the World's People Live in Urban Areas

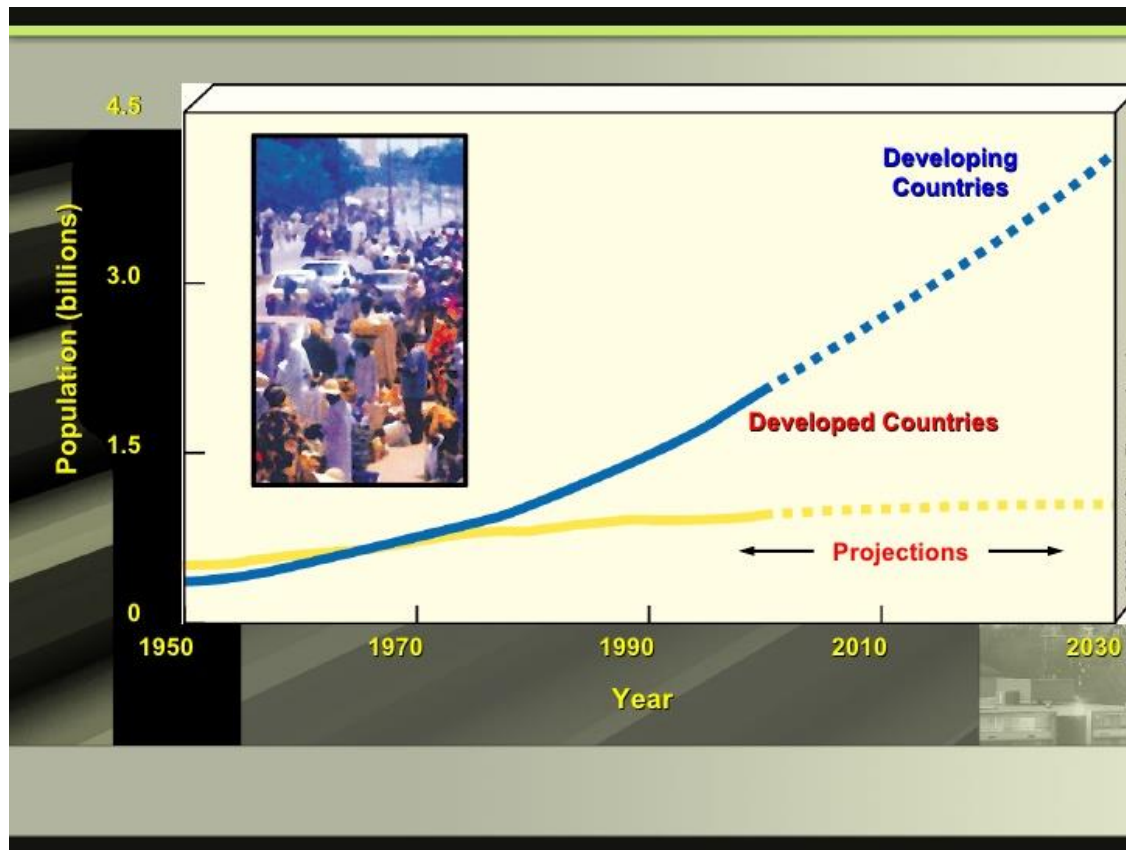
- Four major trends

- Proportion of global population living in urban areas is increasing
- Number and size of urban areas is mushrooming
 - Megacities – more than 10 million - 18
 - Hypercities – more than 20 million - 1 :Tokyo
- Urban growth slower in developed countries
- Poverty is becoming increasingly urbanized; mostly in developing countries

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Growth of Cities in the World



Urbanization Has Advantages

- Centers of:
 - Economic development
 - Innovation
 - Education
 - Technological advances
 - Jobs
- Environmental advantages
 - Recycling
 - Reduce stress on wildlife habitats
 - Save energy – mass transportation

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Urbanization has Disadvantages

- Huge ecological footprints
 - Urban populations occupy 2% of the world's area but consume 75% of the resources and resulting high waste output
- Lack vegetation
 - Vegetation destroyed -buildings, parking lots , roads
 - no absorption of pollutants, shade, aesthetic
- Water problems
 - flooding, destroy wetlands,
 - severe water shortage

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Urbanization Has Disadvantages

- Concentrate pollution and health problems
- Excessive noise
- Different climate and experience light pollution
 - cities warmer, foggier, cloudier than suburbs and nearby rural areas
 - heat generated by industry, heat-absorbing surfaces create URBAN HEAT ISLAND

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NATURAL CAPITAL DEGRADATION

Urban Sprawl



Land and Biodiversity

- Loss of cropland
- Loss of forests and grasslands
- Loss of wetlands
- Loss and fragmentation of wildlife habitats



Water

- Increased use of surface water and groundwater
- Increased runoff and flooding
- Increased surface water and groundwater pollution
- Decreased natural sewage treatment



Energy, Air, and Climate

- Increased energy use and waste
- Increased air pollution
- Increased greenhouse gas emissions
- Enhanced global warming



Economic Effects

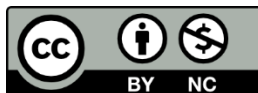
- Decline of downtown business districts
- Increased unemployment in central city
- Loss of tax base in central city

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Fig. 22-6, p. 593

Climate Change



- Climate Change




- 2016 beat 2015 as the warmest year on record
- 90 percent likelihood that global temperatures will rise anywhere from 2 degrees to 4.9 degrees Celsius by 2100

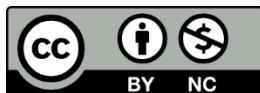
- Climate Change Related Hazards
 - Sea level rise
 - Coastal flooding
 - Hurricanes/Typhoons
 - Storm surge
 - Droughts
 - Fires
 - Floods
 - Tornadoes

75%

global CO2 emissions
attributable to cities

 WORLD RESOURCES INSTITUTE

Disasters & Disaster Vulnerability



- Disasters

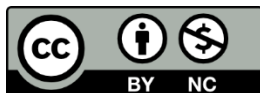
- Over the last 20 years, some 90 percent of major recorded disaster events have been weather-related
- 6,457 weather-related disasters between 1995 and 2015
- doubling of such events yearly over the last decade

- Disaster Vulnerability (contd.)
 - Between 1975 and 2000 the number of megacities in low- and middle-income nations increased from 2 to 13.
 - Of the 23 megacities worldwide in 2011 (UN-DESA 2012) 16 were coastal.

Problems With Increased Density

- Food Insecurity
 - Shrinking percentage of food in urban areas is locally sourced, e.g. within 160 km
- Lifeline services vulnerability
 - Increasing numbers of people dependent upon large centralized systems for electricity, gas, water, sewer, telecommunications, etc.
- Increased waste
- Declines in mental and physical health

High Rise Buildings





- Motivations for building high rise buildings
 - Policies promoting increased density
 - Power & prestige
 - Land in urban centers extremely costly
 - Increased height = increased construction costs
 - Costly land + construction = luxury units
 - While more profitable for developer, the result is gentrification & inequality

- Considerations for High Rise Buildings
 - **High-rise scale is not human scale**
 - Make no visual sense to a pedestrian at eye-level
 - Become lost and engulfed in glass and steel canyons which can be sterile, isolating and dehumanizing
 - Cannot see faces of people above 5-6 stories
 - 7 Reasons Why High-Rises Kill Livability, Bloomingrock, *Smart Cities Dive*

- Considerations for High Rise Buildings (contd.)
 - **High-rises separate people from nature and each other**
 - Unnatural. We are wired to have the earth under our feet and to interact with nature, events and each other at ground level.
 - People are less likely to leave their houses. Encourages enclaves and gated communities.
 - Meaningful contact with ground level events is possible only from the first few floors in a multi-story building. Between the third and fourth floor, a marked decrease in the ability to have contact with the ground level can be observed. Another threshold exists between the fifth and sixth floors. Anything and anyone above the fifth floor is definitely out of touch with ground level events.
 - 7 Reasons Why High-Rises Kill Livability, Bloomingrock, *Smart Cities Dive*

- Considerations for High Rise Buildings (contd.)
 - **High-rises radically reduce chance encounters and propinquity**
 - Elevators and hallways shield us from contact with one another
 - 7 Reasons Why High-Rises Kill Livability, Bloomingrock, *Smart Cities Dive*

- Considerations for High Rise Buildings (contd.)
 - **High rises can overload cities infrastructure**
 - Service capacity of mass transit, roadways and utilities can be exceeded

- Considerations for High Rise Buildings (contd.)
 - **High rises can create undesirable microclimates**
 - Shadow effects
 - Wind effects, including channeling, downdraught, corner and gap

- Considerations for High Rise Buildings (contd.)
 - **Increased Energy Consumption**
 - Water distribution
 - Elevators
 - Effects of wind and sun = greater heating & cooling demand
 - One study found that downtown high-rise living in Chicago, IL accounts for approximately 25% more life-cycle energy per person per year than suburban low-rise living
 - Life-Cycle Energy Implications of Downtown High-Rise vs. Suburban Low-Rise Living: An Overview and Quantitative Case Study for Chicago, *Buildings*, Vol. 5 No. 3

- Considerations for High Rise Buildings (contd.)
 - **Less green**
 - Built of steel and concrete whose manufacture generates more greenhouse gases (GHG) than compared to building materials available to low and mid-rise buildings, e.g. wood
 - Wood (trees) sequester carbon
 - Concrete is 10 times more GHG-intensive than wood

- Considerations for High Rise Buildings (contd.)
 - **Disasterous**
 - Fires
 - Grenfell Tower in London on June 14, 2017 killed at least 80 people
 - 63-story luxury hotel in Dubai on New Year's Eve in 2016
 - Dubai's 86-story residential tower 28 July 2017
 - Evacuation is the proverbial problem still yet unsolved
 - Earthquakes
 - Subject to building failure with greater impact

- Considerations for High Rise Buildings (contd.)
 - **Psychosocial considerations**
 - City dwellers have a [40% increased risk of depression and double the rate of schizophrenia](#), according to the Centre for Urban Design and Mental Health.
 - Residents of high-rise blocks tend to suffer from more stress, mental health difficulties and neurosis, with child development particularly affected. ([2016 report on the design of cities](#))

Greening the City

- Within the context of carrying capacity, greening the cities will require less density, not more. We need space for de-industrialized architecture, for smaller communities whose inhabitants know and trust one another, for improved mental and physical health, for urban organic agriculture, for decentralized lifeline services, for ecological diversity, and for overall improved biological health of our natural world of which we are a part.

The ultimate challenge: how to reverse urbanization – a vision

- Use incentives and dis-incentives
- Create largely self-sufficient eco-pueblos
- Connect eco-pueblos with urban centers via electric trains
- Regenerate human-scale community life
- Reconnect with nature, the REAL lifeline service, e.g. clean air, clean water, clean soil

Questions? Comments?

