Human settlement systems

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Overview

- P/D/U/E in the news
- Urbanization processes (R/U)
- Settlement systems (single country, multi-city)
- Globalization (multi-country, multi-city)

P/U/D/E in the news

The Guy Who Picks the Best Places to Live

Every so often, a report comes out listing the best (or worst) cities to live in, the most romantic, the most child-friendly or the most affordable.

Urbanization processes

What is urban?
Urbanization processes

• Trends
• Types of cities
• Two sector model (rural-urban)
• Balanced urbanization / complex problems

Urbanization processes: Trends

- Carl Sauer: *Agricultural Origins and Dispersals* (1952)
  - locational principles
    - Agriculture did not originate from a growing or chronic shortage of food (people living at comfortable margin)
    - The hearths of domestication are to be sought in areas of marked diversity of plants and animals where there were varied ad good raw materials to experiment with. (variety of terrain / climate)
    - Primitive cultivators could not establish themselves in large river valleys subject to lengthy floods and requiring protective dams...
    - Agriculture began in wooded lands (not grasslands)

Urbanization processes: Trends

- Urban / City versus Rural / Agriculture
- Earliest settlements give rise to agriculture
- All settlement history characterized by series of innovations needed to overcome problems:
  - work, family, distribution systems, record keeping, police, armed forces
  - power structures / economic systems / religion
  - civilization: complex web of cultures, technologies,…

Urbanization processes: Trends

- urbanization – long run settlement history (1st revolution)
  - hunter-gatherer —> agricultural revolution
  - villages
  - ‘urban’ is feature of the settlement system but is not the dominant form

- modern urbanization – 1800 to present (2nd revolution)
  - acceleration in urban / rural balance

- Carlson: *Urbanization Processes* (1952)
The First Urban Revolution

Two components enable the formation of cities:

1. an agricultural surplus
2. social stratification
   (a leadership class)

Two other components may have forced the cluster of innovations associated with sedentary living:

1. population pressure
2. climate change

Urbanization processes: Long run settlement history

Agricultural Villages

• Before urbanization, people often clustered in agricultural villages – a relatively small, egalitarian village, where most of the population was involved in agriculture. About 10,000 years ago, people began living in agricultural villages.

Urbanization processes: Long run settlement history

The First Urban Revolution

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Urbanization processes: Long run settlement history

Five Hearths of Urbanization

In each of these hearths, an agricultural surplus and social stratification created the conditions necessary for cities to form and be maintained.
Between 300 and 900 CE, Altun Ha, Belize served as a thriving trade and distribution center for the Caribbean merchant canoe traffic.

**Five Hearths of Urbanization**

- Mesopotamia, 3500 BCE
- Nile River Valley, 3200 BCE
- Indus River Valley, 2200 BCE
- Huang He and Wei River Valleys, 1500 BCE
- Mesoamerica, 200 BCE

**Huang He and Wei River Valleys**

The Chinese purposefully planned their cities.
- centered on a vertical structure
- inner wall built around center
- temples and palaces for the leadership class

Terracotta Warriors guarding the tomb of the Chinese Emperor Qin Xi Huang

**Mesoamerica**

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**Urbanization processes: Long run settlement history**

**Indus River Valley**

Harappa and Mohenjo-Daro were two of the first cities of the Indus River Valley.
- intricately planned
- houses equal in size
- no palaces
- no monuments

**Mesoamerica**

Mayan and Aztec Civilizations
Many ancient cities were theocratic centers where rulers were deemed to have divine authority and were god-kings.

**Urbanization processes: Types of cities**

- Why do cities exist?
  - Trading cities
  - Market cities
  - Industrial cities
  - Other pure functions (government, religion, outpost)
The Roman Forum

Aqueducts in Nimes, France

Diffusion of Urbanization

The Greek Cities
by 500 BCE, Greeks were highly urbanized.
– Network of more than 500 cities and towns
– On the mainland and on islands
– Each city had an acropolis and an agora

Urbanization processes: Long run settlement history

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Urbanization processes: Long run settlement history

The Roman Cities
a system of cities and small towns, linked together with hundreds of miles of roads and sea routes.
– Sites of Roman cities were typically for trade
– A Roman city’s Forum combined the acropolis and agora into one space.
– Roman cities had extreme wealth and extreme poverty (between 1/3 and 2/3s of empire’s population was enslaved)

Diffusion of Urbanization

During the mercantile era, the cities that thrived were embellished by wealthy merchant families, who built ornate mansions, patronized the arts, participated in city governments, and supported the reconstruction of city centers.

Genoa, Italy

Roman Empire

The acropolis

the agora

Athens, Greece

Aqueducts in Nimes, France
Urbanization processes: Two-sector model (R-U)

- Is there a pattern for urbanization trajectories?
- Is that pattern related to context of urbanization?
  - Yes, logistic growth curve
  - Yes, development context and historical period. (U.S. 1/4 to 1/25)
  - Rapid urbanization can be problematic

Urbanization processes: Two-sector model (R-U)

Pull factors: (What is the utility of urban areas?)

1. Agglomeration
   - internal versus external scale economies
2. City as engine of growth (base multiplier concept)
   - employment is self-reinforcing (positive feedback)
3. Decision context of potential rural to urban migrant
   - choice under uncertainty
   - expected probability of employment in rural versus urban
   - expected wage rate in rural versus urban
   - vagaries of youth and perceived immortality

Urbanization processes: Two-sector model (R-U)

Push factors: (Why leave the rural sector?)

1. High birth rates & surplus labor
   - safety net, land tenure laws, famines
2. Labor saving technologies
3. Relative productivity differences / wage differences
4. Economic viability of “small” farms
   - low prices, price fluctuations, government intervention, mechanization and credit crunch.

Urbanization processes: Two-sector model (R-U)

Economic context: urbanization & sectoral composition

1. Primary sector: agriculture, mining, lumber, livestock
2. Secondary sector: manufacturing
3. Tertiary sector: services
4. Quaternary sector: research & administration

Urbanization processes: Balanced urbanization / complexity

- What types of problems are related to urbanization?
- Problems with rapid growth (in-migration)
  - Ghettos / shanty towns
  - urban services and infrastructure
  - perception and migration decisions
- Problems of advanced urban areas
  - urban core (CBD)
  - out-migration
  - decreasing returns to scale
  - crime, congestion, pollution
Settlement Systems: Rank size rule

- Settlement 'chains' = rank size distribution
- Rank size rule
  a. \( P(\text{rank}) = P(1)/\text{rank} \), let rank=r
  b. \( P(r) = a \ r^{-b} \)
  c. \( \ln(P(r)) = \ln(a) - b \ln(r) \)
- Examples
- Implication: binary and primate distributions

Settlement Systems: Rank size rule
Hypothetical perfect rank size dist.

Settlement Systems: Rank size rule
Empirical distribution for U.S. metro areas

Settlement Systems: Rank size rule
Empirical distribution for Oregon places

Settlement Systems: Rank size rule
Settlement Systems: Rank size rule

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Settlement Systems: Rank size rule

Urbanization processes: Balanced urbanization / complexity

Settlement Systems: Food Production
- Cities, civilization, and attitude towards nature
  - 1st agricultural revolution
  - 2nd agricultural revolution
  - 3rd agricultural revolution
- Human settlement and innovations
- Ethical issues in settlement systems & food production
  - Sprawl
  - Food as a commodity → Factory Farms
  - Concentrated Animal Feeding Operations (CAFOs)

Settlement Systems: Central Place Theory
- Centrality
  - Threshold: minimum market size needed to earn profit
- Range: max. dist. consumer is willing to travel to purchase product.
Settlement Systems: Central Place Theory

• Excess Profits → Spatial Competition

• Central place hierarchy, ordering, nesting

• Central Place Theory (cont.)
  – Relax Assumptions:
    > Population/income variation
    > Transport surface
    > Consumer behavior
    > Profits

Settlement Systems: Central Place Theory

• Assumptions:
  1. Uniform spatial distribution of population/income
  2. Isotropic transport surface
  3. Consumers patronize nearest store
  4. No excess profits (range=threshold)

➤ Given 1-4, spatial equilibrium yields *hexagonal* trade areas