Unit 3

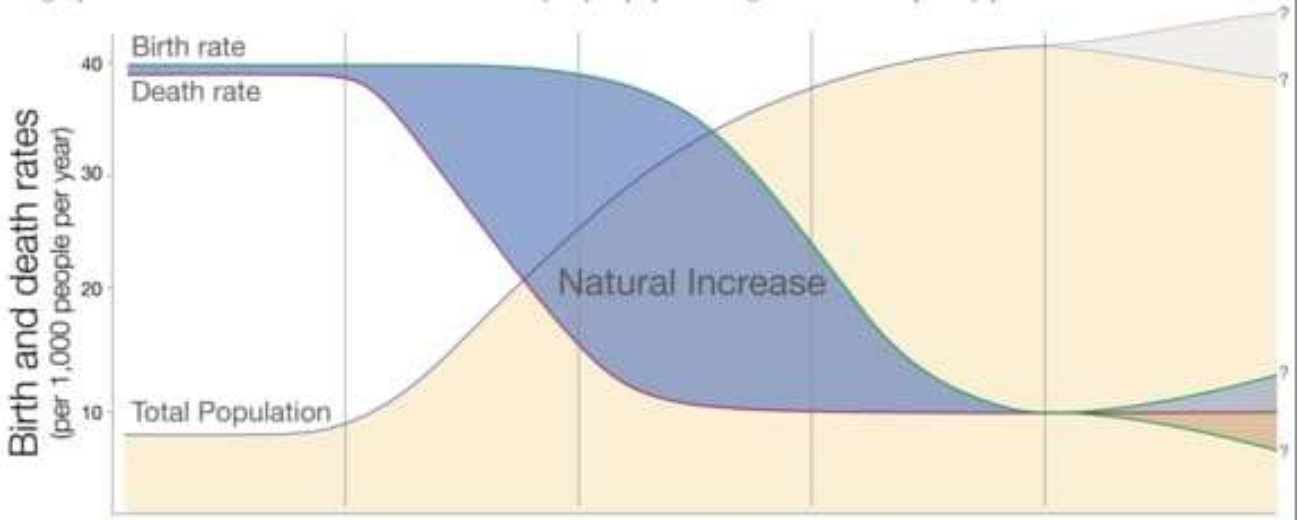
POPULATION THEORIES AND MODELS

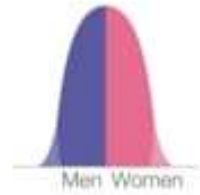
Theory of Demographic Transition:

Demographic transition is a term, first used by Warren S. Thompson (1929), and later on by Frank W. Notestein (1945), referring to a historical process of change which accounts the trends in births, deaths and population growth that occurred in today's industrialized societies, especially European societies. This process of demographic change began for the most part in the later 18th century.

The five stages of the demographic transition

The demographic transition is a model that describes why rapid population growth is a temporary phenomenon.



	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Birth rate	High	High	Falling	Low	Yet to be seen (Possibly falling further, possibly rising again)
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Rapid increase	Increase slows down	Falling and then stable	Little change
Population Pyramid					

Demographic transition should not be regarded as a ‘law of population growth’, but as a generalized description of the evolutionary process. In simple terms, it is a theory which attempts to specify general laws by which human populations change in size and structure during industrialization. It is frequently accepted as a useful tool in describing the demographic history of a country

The theory postulates a particular pattern of demographic change from a high fertility and high mortality to a low fertility and low mortality when a society progresses from a largely rural agrarian and illiterate society to a dominant urban, industrial, literate and modern society

It is typically viewed as a three-stage process:

(i) That the decline in immortality comes before the decline in fertility,

(ii) that the fertility eventually declines to match mortality, and

(iii) that socio-economic transformation of a society takes place simultaneously with its demographic transformation.

The demographic transition theory is characterized by conspicuous transition stages.

The transition from high birth and death rates to low rates can be divided into three stages (some scholars like Haggett, 1975 have divided into four or five stages):

i. Pre-transition stage:

High and fluctuating birth and death rates with little population growth.

ii. Stage I:

High birth rates and declining death rates with rapid population growth.

iii. Stage II:

Low birth and death rates with slow population growth.

iv. Stage III:

Birth and death rates both decline appreciably leading to zero population growth. The theory holds that pre-industrial societies were characterized by stable populations which had both a high death rate and birth rate. It postulates a little and slows population growth. The theory states that the high mortality rates characteristic of undeveloped areas will decline before fertility rates which are also high.

In the first stage of transition, death rates (especially the infant deaths) begin to fall as a result of advances in public health and sanitation as well as improvements in nutrition and food supply. Since

the birth rate continues to remain high relative to the declining death rate, there is a rapid ‘transitional’ growth as we find in India today.

In the second stage, changes in social attitudes, the introduction of cheap forms of contraception and increases in life expectancy create social pressures for smaller families and for a reduction of fertility.

The diffusion of knowledge and cheap medical technology has brought many non-industrial societies into this stage of the demographic transition however, these societies have been unable to enter the third stage. The result has been very high rates of population growth in countries that are not experiencing corresponding economic growth.

In the last (third) stage of demographic transition birth and death rates decline appreciably which eventually becomes approximately equal, and in time it will result in zero population growth. Before this stage begins, there can be one more stage in which low birth and death rates lead to slow population growth.

The populations of advanced, urban industrial societies, which have entered the last stage, are now stable with low birth and death rates. In some cases (e.g., Eastern and Central Europe) birth rates have fallen so slow that the rate of natural increase was actually zero or negative. In this stage, the technical know-how is abundant, the deliberate controls on family planning are common and the literacy and education levels are also very high.

Criticism

The main points of criticism are:
Firstly, this theory is merely based upon the empirical observations or the experiences of Europe, America and Australia.
Secondly, it is neither predictive nor its stages are segmental and inevitable.
Thirdly, the role of man's technical innovations cannot be underrated, particularly in the field of medicine, which can arrest the rate of mortality.
Fourthly, neither does it provide a fundamental explanation of the process of fertility decline, nor does it identify the crucial variables involved in it.

Fifthly, it does not provide a time frame for a country to move from one stage to another.

Finally, it does not hold good for the developing countries of the world, which have recently experienced unprecedented growth in population due to drastic decline in death rates.

In spite of these criticisms and shortcomings, the demographic transition theory does provide an effective portrayal of the world's demographic history at macro level of generalizations. As an empirical generalization developed on the basis of observing the demographic trend in the West, the transition process for any country can easily be understood.

Models in population studies

1. Demographic Transition Model (DTM)

The DTM describes the transition from high birth and death rates to low birth and death rates through four stages: pre-industrial, transitional, industrial, and post-industrial.

It is used to understand population growth and decline, and to predict future demographic changes.

2. Migration Models

Ravenstein's Laws of Migration: These laws describe patterns of migration, such as the tendency for most migrants to move short distances and the role of economic factors in migration decisions.

- Lee’s Push-Pull Model: This model explains migration through push factors (conditions that drive people away from their current location) and pull factors (conditions that attract people to a new location).

- 3. *Gravity Model of Migration*:
- This model is based on the idea that the interaction between two places is proportional to their population sizes and inversely proportional to the distance between them.
- - It is used to predict migration patterns and the flow of people, goods, and information between location.

- 4.Population-Resource Region Model
- This model examines the relationship between population distribution and resource availability, often used to study overpopulation and resource depletion in specific regions.
- It helps in planning resource management and addressing sustainability issues.5

- 5. Cohort Component Model
- This model projects population changes by considering age-specific fertility, mortality, and migration rates.
- It is used for population projections and demographic analysis.

6. Urban Transition Model:

Similar to the DTM, this model describes the stages of urbanization from rural dominance to urban dominance, considering factors such as economic development and migration. -

It is used to study the process of urbanization and its impacts on population distribution and city planning..

- 7. Spatial Interaction Models
- These models examine the movement of people, goods, and information between locations, influenced by factors such as distance, accessibility, and transportation networks.
- They are used in transportation planning, urban development, and regional analysis

Under population

- Underpopulation occurs when a region has a population size that is too small to fully utilize its resources and support its economic potential. This can result in a labor shortage, underutilized infrastructure, and a decline in economic growth.
- Examples: Countries like Japan and some Eastern European nations experience issues related to underpopulation, such as aging populations and declining birth rates

Characteristics

- 1. Labor Shortages: Insufficient workforce to meet the demands of the economy.
- 2. Underutilization of Resources: Natural and economic resources are not fully exploited.
- 3. High Dependency Ratios: A high proportion of dependents (children and elderly) compared to the working-age population.
- 4. Economic Challenges: Reduced economic growth, potential declines in productivity, and difficulty sustaining public services and infrastructure.

Over population

- Definition: Overpopulation occurs when a region has a population size that exceeds its carrying capacity, leading to resource depletion, environmental degradation, and a decline in the quality of life
- Examples: Countries like India and Nigeria face challenges associated with overpopulation, including high population density and resource constraints.

Characteristics

- 1. Resource Depletion: Excessive demand on natural resources such as water, food, and energy.
- 2. Environmental Degradation: Increased pollution, deforestation, and loss of biodiversity due to overuse of land and resources.
- 3. Infrastructure Strain: Overburdened infrastructure and public services, including healthcare, education, and transportation.
- 4. High Unemployment and Poverty: High population growth can lead to insufficient job creation and increased poverty levels.

Optimum population

- Optimum population refers to the ideal population size that allows for the maximum sustainable economic welfare and quality of life for the inhabitants of a region. It is the balance between population size and resource availability.
- Examples: Countries like Canada and Australia are often cited as closer to the concept of optimum population due to their balanced population sizes and resource management.

Characteristics

- 1. Balanced Resource Use: Efficient and sustainable use of natural and economic resources.
- 2. Economic Efficiency: High levels of productivity, employment, and economic growth.
- 3. Quality of Life: High standards of living, with access to healthcare, education, and other essential services.
- 4. Environmental Sustainability: Maintaining ecological balance and minimizing environmental impact

Contemporary issues

- Contemporary population issues include:Population aging: The proportion of older people in the world's population is growing, and is projected to double by 2050.
- Population growth: Rapid population growth can have negative effects on the environment, health, and society.
- Migration: The globalization of people, goods, and transit can create challenges for population policies.
- Climate change: Climate change is a contemporary demographic challenge.Health: Issues include access to sexual and reproductive health services, and the spread of infectious diseases.
- Poverty: Poverty is another contemporary population issue.

- One contemporary issue related to population is the challenge of overpopulation. As the global population continues to grow rapidly, it strains resources such as food, water, and energy, and exacerbates environmental issues like deforestation and climate change. Urban areas often face congestion and inadequate infrastructure, while rural regions may experience the depletion of natural resources. Addressing these issues requires a multifaceted approach, including sustainable development practices, education on family planning, and policies aimed at balancing population growth with resource management.