
DEMOGRAPHIC PERSPECTIVES

A demographic perspective is a way of relating basic population information to theories about how the world operates demographically

PREMODERN POPULATION DOCTRINES

Population doctrines and theories prior to Malthus tended to be pronatalist and often utopian. Condorcet and Godwin were two such theorists, and they stimulated Malthus to write his Essay on Population

THE MALTHUSIAN PERSPECTIVE

1. The Malthusian perspective is based on the writings of Thomas Robert Malthus, whose first Essay on Population appeared in 1798 and has been one of the most influential works ever written on population growth and its societal consequences.
2. Causes of Population Growth According to Malthus, population growth is generated by the urge to reproduce, although growth is checked ultimately by the means of subsistence.
3. Consequences of Population Growth The natural consequences of population growth according to Malthus are misery and poverty because of the tendency for populations to grow faster than the food supply.
 4. Avoiding the Consequences Nonetheless, he believed that misery could be avoided if people practiced moral restraint—a simple formula of chastity before marriage and a delay in marriage until you can afford all the children that God might provide.
5. Critique of Malthus Karl Marx and Friedrich Engels strenuously objected to the Malthusian population perspective because it blamed poverty on the poor rather than on the evils of social organization
6. Marx and Engels believed that overpopulation was a product of capitalism and that in a socialist society either there would be enough resources per person or else people would be motivated to keep families small.
7. Neo-Malthusians Not surprisingly, very few people have bought the Malthusian idea of moral restraint, although there are many who agree that population growth tends to outstrip food production. Such people are/usually called neo-Malthusians and believe in the use of birth control.
8. THE MARXIST PERSPECTIVE Revisions of Marxist ideology frequently include a more active government role in trying to influence birth limitation.
9. OTHER EARLY MODERN POPULATION THEORIES
10. Mill John Stuart Mill argued that the standard of living is a major determinant of fertility levels, but he also felt that people could influence their own demographic destinies.
11. Dumont Arsene Dumont argued that personal ambition generated a process of social capillarity, which induced people to limit the number of children in order to get ahead socially and economically.
12. Durkheim Emile Durkheim built an entire theory of social structure on his conception of the consequences of population growth.
13. THE THEORY OF THE DEMOGRAPHIC TRANSITION
14. Critique of the Demographic Transition Theory The theory of the demographic transition is a perspective that emphasizes the importance of economic and social development, which leads first to a decline in mortality and then, after some time lag, to a commensurate decline in fertility. It is based on the experience of the developed nations.

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15. Reformulation of the Demographic Transition Theory Reformulations of the demographic transition theory suggest that secularization and the cultural diffusion of ideas may be important keys to declining fertility.
16. THE THEORY OF DEMOGRAPHIC CHANGE AND RESPONSE
The theory of demographic change and response emphasizes that people must perceive a personal need to change behavior before a decline in fertility will take place, and that the kind of response they make will depend on what means are available to them.
17. THE RELATIVE INCOME HYPOTHESIS The relative income hypothesis views changes in the birth rate as being a response to levels of economic well-being that are relative to those to which one is accustomed, particularly when combined with birth cohorts of unequal size.
18. THEORIES ABOUT THE CONSEQUENCES OF POPULATION GROWTH
19. THERE ARE MANY OTHER THEORIES

LIMITS TO GROWTH

Introduction

1970's First official concern expressed about the gathering rates of global population growth and their implications for future well being.

Although some academicians have been trying to awaken political leaders of the potential future problems it was Club of Rome who first captured the attention of some governments.

Club of Rome: A body founded in 1968, by an international group of philosophers, economists, managers, scientists, technologists and others. The club's objective was to understand the workings of the whole world as a finite system by studying the interactions of economic, scientific, biological and social components of the present actions and policies and to formulate alternative policies where deemed necessary on environmental and survival grounds.

The meeting of Club of Rome in 1970, resulted in the appointment of an international investigative team under Prof. Dennis Meadows.

They were asked to analyse the five basic factors that determine, and therefore ultimately limit growth on this planet. The findings were published in 1972 under the title of LIMITS TO GROWTH.

The limits to Growth Model

The model looks at the dynamic interaction of five variables: population, agricultural production, natural resources, industrial production and pollution.

Assumptions of the Model

1. A finite stock of exploitable non renewable resources.
2. A finite amount of land that can be used to grow food.
3. A finite capacity of the environment to absorb pollutants
4. A finite yield of food that can be obtained from each unit land
5. Exponential growth of population, pollution and industrial output as long as resource supplies & interaction with the variable in the system permit.
6. Forms of technological changes are built into the model provided there is paying capacity and environmental technology.

Projections of the Model

Question 1: Present population growth and industrial output continue.

Result & Projection: After 2000 non renewable resource depleted, scarcity of food, death rates rise, population crashes.

Question 2 : Technological advances double resource reserve and allow recycling of 75% of all resources.

Result & Projection: Pollution rises sharply, death rates rise, population declines.

Question 3: In addition to assumptions in Question 2, pollution crisis is avoided by reducing pollution level 75%.

Result & Projection: All farming land is exhausted, per capita food supply declines and population declines.

Question 4: In addition to assumptions of Question 3, we double the agricultural yield unit cropland and control population through birth control methods.

Result & Project: The resulting high standards depletes, non renewable resources and population crashes eventually.

Question 5: If

- (i) Everyone has access to birth control facility,
- (ii) World industrial Output/capita stabilizes at 1975 level,
- (iii) Resource consumption reduced to $\frac{1}{4}$ th of 1970 production,
- (iv) Pollution reduces to $\frac{1}{4}$ th of 1970 value of production,
- (v) Consumption shifts from material goods to health,
- (vi) Industrial capital is built to last longer.

Result & Projection: Population rise and living standards improve.

Question 6: If we wait till 2000 instead of 1975 to put the policies of Questions 5 into effect.

Result & Projection: Population rise depletes resources severely, population eventually drops

Limits to Growth Model is an addition to neo-Malthusian school of thought

Limitations of the model

1. Resources are not, they become.
2. Boserup thesis.
3. Does not assume that technological innovations will increase exponentially. Therefore does not assume that technology can solve every problem that might arise.
4. Treats the whole as single unit.

The Mesarovic—Pestle Model

1. It assumes the world is an inhomogeneous region
2. Divided the world into 10 fairly homogeneous regions
3. Also includes assumptions about economic aid to poor countries
4. The results of that model were published in a book mankind at 'The Turning point.

Conclusions of the Model

1. Poorer regions will experience collapses of resource and food supplies and a sharp drop in population before 2050
2. Regional collapses can be prevented by global cooperation among 10 regions, if the regions fail to cooperate and pursues path of rapid population growth and excessive resource use, there will be collapse
3. If any region fails to cooperate and pursues path of rapid population growth and pursues path of rapid population growth and excessive resource use, there will be collapse
4. If rich nations delay in making massive economic aid available to poor nations, eventual solutions will be extremely difficult and expensive.

Criticisms

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1. Technological optimism
 2. Too simplistic politically and economically by assuming that all the problems of the poor countries can be solved by providing them assistance and not technology.
 3. Emphasizes what the rich countries must do rather than what the poor countries must do.

ENSEMBLE

URBAN SPRAWL

I. Concept

- Refers to an expanding form of an urban centre
- Different from suburbs which are pockets of growth

II. Characteristics

- Gentle density gradient implying less congestion & large area under coverage
- Clear segregation of lower strata from elite class
- Fairly homogeneous composition
- Territorial segregation
- To Cater to the sprawl needs – basic amenities to be extended
- Higher dependence on vehicular transport (being away from the main city)

III. Factors of Evolution

Found mostly around metros; likely to develop around newly emerging metros factors are

- (a) Decaying CBD – Congestion, costly, development of transport facilities, stressed living cond., ↑ family size & relocation of entertainment centres outside the core.
- (b) Attraction of Suburbs – Single family dwelling; space; privacy; ownership; better living conditions
- (c) Dynamic Factors – Transport & Communication Development; e-banking, e-commerce etc.; demand for cheaper housing.
- (d) Government – Policies – To development residential & commercial in sprawls.

IV. Impact

- (i) Change in lifestyle – Global
- (ii) Change in retailing pattern – low density, malls, shopping plazas
- (iii) Restructured retailing in CBD – Banning motor use
- (iv) Decentralisation of offices & commercial activities with changed workplace concept.

Central Place Theory by Christaller

I. Introduction

- Proposed by a German Geographer, Walter Christaller in 1933. It is a deterministic theory.

II. Aim of the Theory

- To explain the number, location, size, spacing and functions of a settlement within a urban system.

III. Assumptions

- An isotropic surface (uniform in respect of terrain, climate and soil) presenting equal ease and opportunities of movement in all directions.
- Transport costs are proportional to distance and there is only one type of transport.
- Evenly distributed population and purchasing power.
- Central places are located to provide goods, services and administration functions to their hinterland.
- Consumers travel to the nearest Central places that provides the function they demand.
- The suppliers of these functions act as economic man, i.e., they attempt to maximise their profit by locating themselves as far away from one another as possible to maximise their market areas.
- All consumers have the same income and the same demand for goods and services.

IV. Principles

There are two major principles underlying Christaller's Theory.

Range of a good, which refers to maximum distance that consumers are willing to travel to purchase that goods or services. Higher order goods have longer ranges. For example, consumers are willing to travel further to purchase clothing and jewellery than they are to buy groceries or travel to the post-office. Also the transport cost increases with distance, therefore demand decreases with distance from Central Place.

Threshold of goods, which refers to a minimum demand or size of market for the profitable sale of the good. For example, a hairdresser must cut enough heads of hair in a week to pay for the shop's maintenance and wages.

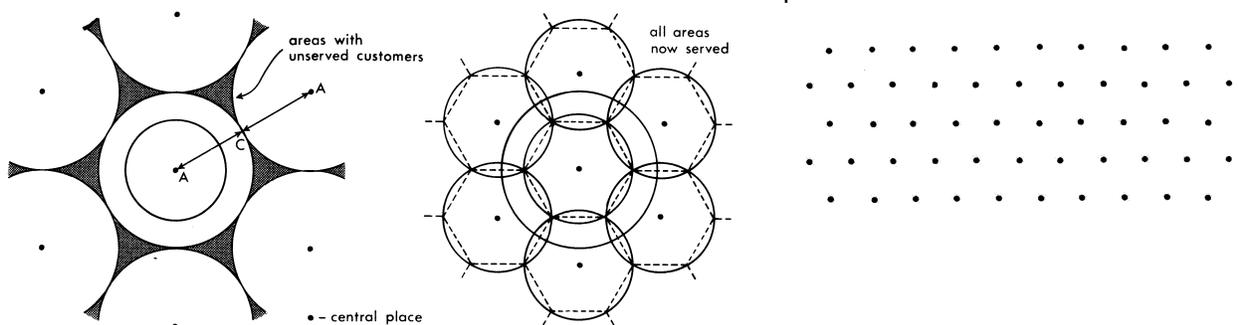
Higher order goods also have a larger threshold. A grocery store can thrive in a hamlet, as it needs only a few hundred customers, but a jewellery store would probably need a trade area incorporating several thousand potential customers to be profitable

Explanation of his principle by choosing Hexagone.

Each supplier is equidistant from 6 nearest competitors.

Circular trading center would be most efficient in terms of accessibility to the centre.

Either they would overlap or leave a vacuum – Therefore \diamond Hexagon retaining the properties of circle, leaving no possible customer unserved.



Hierarchy of settlements

- Higher order centres
- Lower order centres
- Higher order goods
- Lower order goods

ENSEMBLE

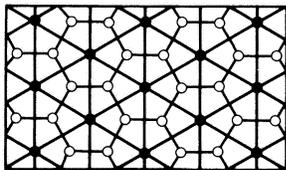


Largest settlement would provide the largest number and greatest variety of goods and vice versa.

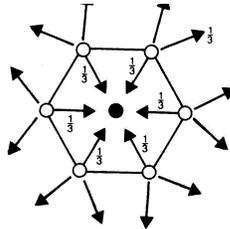
Christallers K value

1. Marketing Principle

$K = 3 (6 \times 1/3 + 1)$



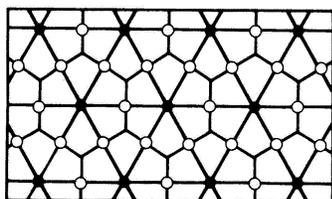
Market optimising K = 3



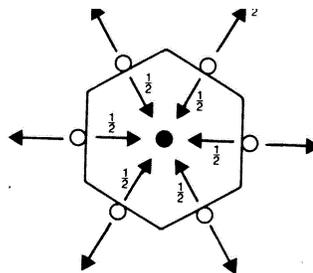
Shoppers in the smaller places divide into 3 equal groups when shopping in the 3 nearest larger places

2. Traffic Principle

$K = 4 (6 \times 1/2 + 1)$



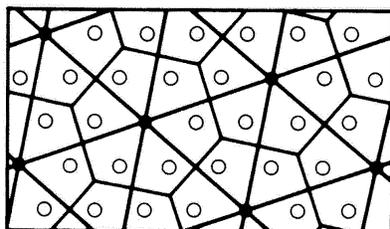
Traffic optimising K = 4



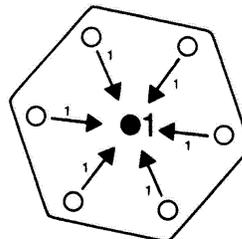
Shoppers in the smaller places divide into 2 equal groups when shopping in the 2 nearest larger places

3. Administrative Principle

$K = 7 (6 + 1)$



Administration optimising K = 7



All shoppers in the smaller places shop in the nearest large place

Limitations

1. Market areas do not have geometrical shape
2. Man does not act rationally always
3. The economic determinism of the theory takes no account of random historical factors that can influence the settlement pattern.
4. The theory makes unrealistic assumptions about the information levels and mental acumen required to achieve rational economic decisions, even if profit maximisation were the only goal of human behaviour.
5. The notion of a homogeneous population ignores the variety of individual circumstances.



6. Uniform unit/one central place is hypothetical
7. Fixed K value shows a very poor approximation with reality.
8. Range of goods is more of a perceived thing.
9. In looking after the aspects of future prospects sometimes the threshold values are not considered.
10. Demand patterns for services and goods have altered because of affluence, change of taste and preferences and greater mobility enabling people to travel further to do their shopping and obtain other services.
11. The theory is not applicable to all settlements. Being limited to service centres, it does not include some of the functions, such as manufacturing industry, that create employment and population.
12. In developed/economically advanced regions the presence of industrial concentration and government policies for regional development will distort the shape
13. Christaller's model assumed relatively little governmental influence on business locational decisions, whereas today national and local governments play a major role in influencing business locations by, for example, offering grants to attract IT firms into Gurgaon and NOIDA.
14. Central-place theory is a static formulation that relates to the distribution of service centres under assumed conditions at one point in time. A particular level of mobility is implied by the assumption that consumers look to their nearest central place to satisfy their needs. Levels of personal mobility have increased greatly since the model was proposed. Consumers do not always visit their nearest store, and multipurpose shopping trips often result in low-order centres being by-passed for low-order goods, thus leading to their decline.
15. Also, in many advanced countries, and due to e-commerce today telecommunications and 'tele-shopping' have further eroded the 'frictional effect of distance on consumer behaviour.
16. Christaller was not unaware of the temporal limitations of his theory, pointing out that: 'The stationary state is only fiction whereas motion is reality. Every factor which adds to the importance of the central of the central place – regional population, supply and demand of central goods, prices of the goods, transportation conditions, size of the central places and competition between central and dispersed production of a good – is subject to continuous change'. Unfortunately, he did not translate these qualifications into a dynamic model of the functional and spatial dimensions of the urban system.



Major Geographical philosophies and their characteristics

Philosophy	Epistemology (E), Ontology (O) and Methodology (M)	Principles	Critique	Major writers
Empiricism	(E) Knowledge gained through experience; (O) We experience what exists, (M) To present experienced facts	Only observational statements are valid. Emphasises the role of scientific inquiry	Data is allowed to define problems. Evidence is not submitted to scrutiny. Rejects theory in favour of observation	Bacon von Humboldt Ritter Locke
Pragmatism	(E) Concrete experience; (M) hypothetico-deductive	Defines meaning and knowledge in terms of function of experience	Emphasises the human element. Concentrates on practical aspects	Dewey James
Positivism	(E) Knowledge gained through experience which must be agreed on; (M) Verification of factual statements	Theory-led. value-free. Progressive unification of laws into a single system. Scientific method of central (especially logical positivism)	Links geography with other subjects. Provides a rigorous base to study. Rigid adherence to science.	Harvey Comte von Thunen Saurer
Idealism	(E) Knowledge is subjective; (O) What exists is that which is perceived; (M) Reconstruction of contexts	Knowledge does not exist without the knower. Reality is mental construction. Centrality of belief	Studies rational actions of humans. Permits study of motives. People not dehumanised. Separates effect from causes	Guelke Dilthey Vidal de la Blache Kirk
Phenomenology	(M) To analyse and identify basic features of subjective	No independent world outside human existence. Study free of presuppositions	Based on emotion but impossible to enter the mind of the subject. Focuses on experience	Husserl Hegel Buttimer



Existentialism	(O) Efforts to overcome detachments; individualistic	Reality created by free acts of human agents. Does not believe in ultimate knowledge (opposite of phenomenology)	Seeks to bridge gap between subjective and objective. Enables geographers to explore shared meaning of landscapes	Stare Heidigger Nietzsche Samuels
Structuralism	(E) Mechanisms not revealed to the world; (O) What exists cannot be observed directly; (M) Construction of theories	Theoretical articulation to find universal structures which provide motive forces in society. Mix of observation and theory	Concern for socio-economic reality. Can expose the entirety of a system. Has been used as the basis for political systems (Marxism)	Levi-Strauss Marx Althusser Habermas
Realism	(E) Nothing exists except by objective senses; (O) Nothing exists which cannot be observed; (M) Study independent of people	Mechanisms are independent from the events they generate. Phenomena can be explained by recourse to structures	Attempts to look at causal mechanisms. Argues against positivism and idealism and their limitations	Bilaskar Keat Urry Nunn
Functionalism	(E) What we see is constructed of functions we cannot see directly; (O) Functions can be seen but not explained; (M) Fieldwork the only way to collect data	Concerned with functions and their analysis. Stresses systematic properties of groups. Society of holistic	Used as a research tool in many social sciences. No agreed standard definition. Static system – cannot account for change	Eisenstadt Darwin Vidal de la Blache Durkheim Parsons



Continental Drift

Introduction

1. Continental Drift is generally ascribed to Wegener (1910) but the germ of the idea can be traced back to Francis Bacon(1620), P.Placett (1668), Antonio Sinder (1858), F.B. Taylor (1908)

Wegener's Theory

What Wegener was trying to explain-climatic change in the past.

Assumptions

1. SIAL is floating on SIMA

2. Existence of Pangaea surrounded by Pathalaasa with South Pole near Durban.

3. Break up accomplished in phases.
 - Phase-I – Pangaea stage during Carboniferous
 - Phase-II – Break up and fragmentation state – Jurassic
 - Phase-III – Opening of Tethys
 - Phase-IV – Westward drift
 - Phase-V – Orogenesis stage

Pangaea (all land) Panthalassa (all ocean) Pangaea consisted of NA (Greenland) Eurasia minus Arabia and India and below it South America and Africa(Arabia) Antarctica Australia and Indian. Between Eurasia and Africa-Tethys Sea i.e supercontinent Pangaea splitted during the Carbonifers drifting took place in two directions

Mechanism

Direction of movement	Causes	Effect
1. Northward	Gravitational Forces i.e. gravitational pull of N.Pole	India and Africa moving north caused the sediments in the Tethys to be crumpled and deformed. Alps and Himalayas formed.
2. Westward	Tidal forces	Andes, Rokies Caribbean islands.

The break up of Pangaea resulted through extensive rifts in the north and south. The northern rift cut Pangaea from east to west creating Laurasia (NA, Greenland and Eurasia (without India and Arabia) and Gondwanaland and (Africa, Arabia, SA, Australia, Antarctica and India). Island Arcs

Evidences given by Wegener

1. Juxtafix of continents 8.3
2. Structural and stratigraphic 8.4, 9.3



3. Fossil Evidence 8.5
4. Palaeoclimatic evidence 8.6
5. Volcanic eruption 11.8b
6. Other evidences Resources (Coal)

Counter Criticism

1. Juxtaposition of continents
Burrard found overlapping at 600 fathoms at Guinea Coast
2. Structural and stratigraphic does not follow radiometric dating and geochronology.
3. Fossil evidences – distribution explained by land bridge hypothesis and parallel evolution.
4. Palaeo climatic : C₁₄ dating was not known to Wegener, the evidences from C₁₄ are different.

Limitations as Scientific Theory

1. Nature of forces not adequate – tidal and gravitational.
2. SIAL floating on SIMA and Andean Coast.
3. Why only northward and westward movement.

Critical Geographers

1. Formation of mountains
2. Against Contractionist School
3. Pre-carboniferous history
4. SIMA exerts great friction
5. Ocean ridge formation
6. Sudden movement and drift not explained

New Evidences favouring Wegener

1. S. Warren Carey, Tasmanian geologist on opposing Coast of Atlantic.
2. Alex Du Toit, South African geologist on opposing Coast of Atlantic
3. Arthur Holmes on Convection Current as mechanism. 8.7, 21
4. PMS Blackett on Palaeo magnetism.
5. Vine & Matthews on Sea Floor spreading.



Jet stream

The velocity of meandering upper westerlies is not originally uniform as the flow becomes concentrated in a narrow core called jet stream. Jet stream are centrally embedded in upper air westerlies.

A strong narrow current concentrated air of quasi-horizontal axis of the upper troposphere or in the stratosphere characterized by strong vertical and lateral wind shear and featuring one or more velocity maximum.

Characteristics

1. Length – thousands of kms, width – hundreds kms, depth-some kms.
2. Wind shear – 5-10 m sec⁻¹, vertical – 5-10 m sec⁻¹, i.e., wind velocity decreases by 5-10 m sec⁻¹, or below, lateral 5 m sec⁻¹, per 100m.
3. Direction – west to east
4. Height – decreases from Equator to poles
5. Movement – Meandering Path (Rossby Waves)

Origin

1. Associated with general Equator to pole temperature gradient that induces a strong westerly component of flow aloft where the temperature gradient becomes particularly strong-Polar Front, Subtropics.

Types of Jet Streams

1. Polar Front— Irregular in longitudinal section and discontinuous.
2. Westerly Subtropical — More persistent
3. Tropical Easterly — Formation due to intense heating of Tibetan plateau.
4. Polar Night Stratospheric Subpolar— Caused due to steep thermal gradient in wind around stratospheric cold pole. Very irregular.
5. Local — Somali, Finadlater.

Significance

1. Transports moisture in stratosphere-noctilutent clouds.
2. Causes horizontal divergence, and convergence.
3. Vertical air motion and churning
 - (a) maintains chemical composition uniform
 - (b) dilutes pollutants
4. Controls monsoon rains over tropics
5. Aid navigation.



Salt Budget

A measure of dissolved solids in seawater, usually expressed in grams per kilogram or parts per thousand by weight (‰). Standard sea-water has a salinity of 35 ‰ at 0°C (32°F).

- The salinity of the oceans varies from about 33 ‰ to 37 ‰, depending on such factors as evaporation, precipitation and fresh water runoff from the continents.
- The world oceans contain about 5000 trillion kilograms (5.5 trillion tons) of salt.
- Salinity budget of the oceans means the income and expenditure of salts in the oceans.
- The salinity budget of the oceans is a balanced one.

The salinity budget of the oceans may be expressed as:

$$(ST + SB + SA + SS) - (Sm + Sb + Se + So) = 0$$

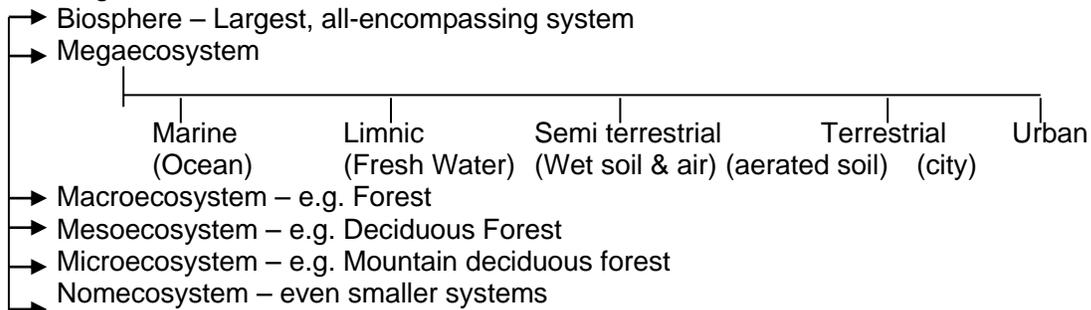
Where

- ST = Salt from the terrain,
- SB = Salt from the marine life,
- SA = Salt from the volcanic eruptions,
- SS = Salt from the space,
- Sm = Extraction of salt from the Sea,
- Sb = Salts consumed by the marine life,
- Se = Salts removed by evaporation, and
- So = Salts removed by other sources.

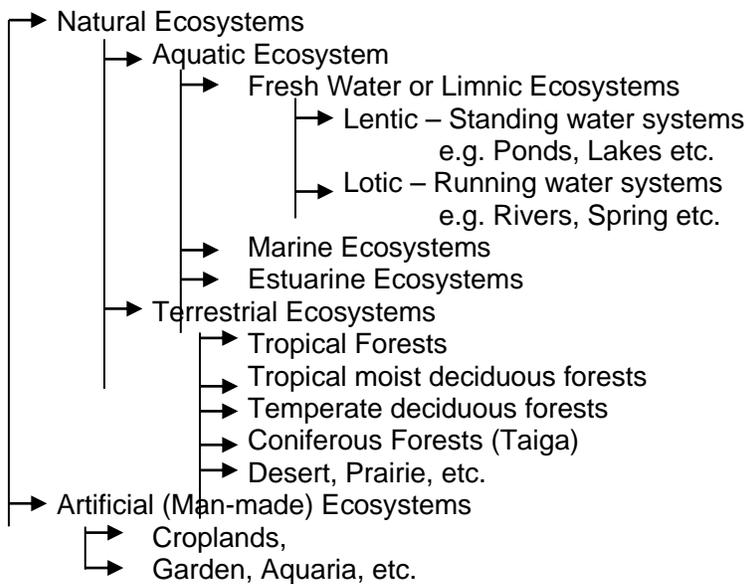


Types of Ecosystems

1. Ellenbergs Hierarchical Classification



Classification based on Human Intervention





Indian Soils: Nature and Formation

Alluvial Soils

Distribution

Covers 24% of land surface. Found in parts of Rajasthan, Punjab, UP, Uttaranchal, Bihar, West Bengal, Orissa, Assam, Narmada, Tapti, Mahanadi, Godavari, Krishna, Kaveri, Brahmaputra, Soorma valleys.

Characteristics

There are two types of alluvial soil—newer alluvium (khadar); it is sandy and occurs near riverbed. The older alluvium (bhangar) is clayey, darker in colour, and occupies the interstream areas.

- (1) Composition - Sandy loam-silt-clay
- (2) Colour-varies, generally grey light brown or yellowish
- (3) Profile shows no marked differentiation
- (4) rich in chemical
- (5) deficient in nitrogen and humus.

Black Cotton Soils

Distribution

Found over Deccan lava gneisses and granites, Western M.P., whole of Maharashtra, South Orissa, S. Coastal Andhra Pradesh, North Karnataka, parts of Rajasthan (Bundi & Tonk), UP, (Bundelkhand) Central and South Tamil Nadu.

Characteristics

- (1) Colour - deep black to chestnut black because of presence of titaniferous magnetite, compounds of Fe and Al, accumulated humus and colloids, hydrated double iron and Al silicates
- (2) Composition- sandy, shallow and poor in fertility on uplands and darker deeper and richer in valleys and lowlands (argillaceous)
- (3) sticky when wet.
- (4) develops wide cracks when dry which helps self aeration and N absorption
- (5) high degree of moisture retentivity
- (6) deficient in Nitrogen Phosphoric acid and humus
- (7) rich in potash lime, Al, Ca, Mg.

Red Soils

Distribution

Large parts of Mysore, N.E Andhra Pradesh, eastern part of M.P., Chhotanagpur (Jharkhand), Orissa, W.B. (Birbhum, Bankura Midnapur) Assam Khasi, Jaintia & Garo, parts of UP & Aravalli hills.

Characteristics



Derived from crystalline and metamorphic rocks

- (1) Colour-red loam
- (2) cloddy structure and low content of concretionary matter and sesquioxides.
- (3) Contains Fe, Mg and Al compounds
- (4) light texture,
- (5) porous friable
- (6) presence of limited soluble salts
- (7) neutral to acid in reaction, deficient in nitrogen, humus, phosphoric acid and lime.

In heavy rainfall areas black and red soils occur in proximity-black in-valley and low lying areas red on-highlands slopes and hill tops.

Lateritic Soil

Distribution

Hills of Deccan, M.P., Rajmahal, E. Ghats, W. Ghats parts of Orissa, Assam, Mysore and Malabar.

Characteristic: (1) Formed in situ under alternate wet and dry conditions high level laterites-derived from bauxite, low level are derived and redeposited from high level.

Compositionc (2) Contains hydrated oxides of Al and Fe (3) High acidity (4) more acidic on higher areas, poor on high level, (5) cannot retain moisture while in plains they consist of heavy loam and clay and easily retain moisture.

Mountain and Forest Soils

Distribution

Vindhyan, Satpura, Nilgiri, Cardamom slopes of Himalayas

Characteristic

- (1) Differ from region to region depending on climate
- (2) deposition of organic matter from forest growth
- (3) slow decomposition makes it acidic
- (4) deficient in potash, phosphoric acid and lime.

Arid and Desert Soils

Distribution

Arid and semi- arid condition in N.W. parts of country.

Characteristics

- (1) light in colour
- (2) high soluble salt content
- (3) low humus
- (4) friable structure
- (5) low in moisture
- (6) rich in phosphates poor in Nitrogen



Saline and Alkaline Soils

Distribution

In arid and semi- arid parts of Rajasthan known as Reh, Kallar, Usar.

Characteristics

Saline and alkaline effervescence consisting of Na, Ca, Mg, Saline contain free sodium alkaline contain large quantities of NaCl.

Peaty and Organic Soils

Distribution

Kerala, N.Bihar, Coastal Orissa, West Bengal and Tamil Nadu.

Characteristics

Saline, rich in organic matter, deficient in phosphate and potassium.



Nuclear Power Programme

In absolute terms, the installed plant capacity of nuclear power has increased from nil in 1950-51 to over 3000MWe.

There are now 14 operating nuclear power reactors (2 boiling water reactors and 12 PHWRs) with a total installed capacity of around 3000 MWe.

The advantages of nuclear energy generation are explained in terms of three C's: is clean, compact and concentrated.

1. Clean—for minimal impact on the environment, compared to other commercial energy generating sources. There are no effects of acid rain due to emission of sulphur dioxide (SO₂), Carbon Dioxide (CO₂), Nitrogen Oxide (NO₂), or heavy metal pollutants. The installation of nuclear power plants involves minimum land requirement and minimum displacement of local populace.
2. Compact—because it is available in the form of fuel bundles, which, once loaded in the reactor core, provide energy for 1.5 to 2 years at a stretch before getting discharged.
3. Concentrated—as one kg uranium gives energy equivalent to 25,000 kg of coal even at 1 per cent utilisation in today's first stage thermal neutron reactors. This can be stepped up to 60 to 70 per cent utilisation in breeder reactors. Which means one kg uranium would give energy equivalent to two million kg of coal.

Obstacles to Development

There are several obstacles hindering the development of nuclear power as a major energy source:

1. Controversy over whether there are sufficient supplies of uranium fuel,
2. Concern over the possibility of a serious nuclear plant accident (meltdown) or plant sabotage that could expose humans to deadly, long-lived radioactive materials,
3. Possible hijacking of nuclear fuel shipments,
4. The waste-storage problem,
5. Possible proliferation of nuclear weapons,
6. Soaring costs, and controversy over the net useful energy yield for the entire system. Before examining the major obstacles to the development of nuclear power.



DRUGS & PHARMACEUTICALS INDUSTRY

I. Introduction

The Indian Pharmaceutical Industry today is in the front rank of India's science-based industries with wide ranging capabilities in the complex field of drug manufacture and technology. A highly organized sector, the Indian Pharma Industry is estimated to be worth \$ 4.5 billion, growing at about 8 to 9 percent annually.

II. Significance

- It ranks very high in the third world, in terms of technology, quality and range of medicines manufactured. From simple headache pills to sophisticated antibiotics and complex cardiac compounds, almost every type of medicine is now made indigenously.
- Playing a key role in promoting and sustaining development in the vital field of medicines,
- It meets around 70% of the country's demand for bulk drugs, drug intermediates, pharmaceutical formulations, chemicals, tablets, capsules, orals and injectibles.
- Technologically strong and totally self-reliant, the pharmaceutical industry in India has low costs of production, low R&D costs, innovative scientific manpower, strength of national laboratories and an increasing balance of trade. The Pharmaceutical Industry, with its rich scientific talents and research capabilities, supported by Intellectual Property Protection regime is well set to take on the international market.

III. Organizations

The Indian Pharmaceutical sector is highly fragmented with more than 20,000 registered units. It has expanded drastically in the last two decades. The leading 250 pharmaceutical companies control 70% of the market with market leader holding nearly 7% of the market share. It is an extremely fragmented market with severe price competition and government price control.

There are about 250 large units and about 8000 Small Scale Units, which form the core of the pharmaceutical industry in India (including 5 Central Public Sector Units). These units produce the complete range of pharmaceutical formulations, i.e., medicines ready for consumption by patients and about 350 bulk drugs, i.e., chemicals having therapeutic value and used for production of pharmaceutical formulations. The main Public Sector Undertakings are:

- (i) Indian Drugs & Pharmaceuticals Limited (IDPL) was incorporated on the 5th April, 1961. The company has presently three manufacturing plants, at
 - Rishikesh in Uttaranchal,
 - Hyderabad in Andhra Pradesh and
 - Gurgaon in Haryana.
 - IDPL has two wholly owned subsidiaries
 - IDPL (Tamil Nadu) Ltd., Chennai in Tamil Nadu and
 - Bihar Drugs & Organic Chemicals Ltd. at Muzaffarpur, Bihar.
 - IDPL has two joint sector undertakings, promoted in collaboration with the respective State Governments.
 - Rajasthan Drugs and Pharmaceuticals Ltd. (RDPL), Jaipur and
 - Orissa Drugs & Chemicals Ltd. (ODCL), Bhubaneswar.
- (ii) Hindustan Antibiotics Ltd. (HAL), Pimpri, Pune was incorporated on 30th March, 1954. This was the first Public Sector company in drugs and pharmaceuticals. HAL has its plant located at Pimpri.
 - There are three joint sector units promoted by HAL in collaboration with the respective State Governments.
 - Karnataka Antibiotics & Pharmaceuticals Ltd. (MAPL) at Nagpur in Maharashtra
 - Manipur State Drugs & Pharmaceuticals Ltd. (MSDPL) at Imphal, in Manipur.

The main products of HAL are bulk drug Penicillin-G, various salts of Penciling and Streptomycin.

The company produces a wide range of Pharmaceutical formulations including agro-vet products.

- (iii) Bengal Chemicals & Pharmaceuticals Limited (BCPL) was incorporated on the 17th March, 1981. The company has four manufacturing units at
 - Maniktala in Kolkata,
 - Panihati at North 24 Parganas (West Bengal),
 - Mumbai (Maharashtra) and
 - Kanpur (UP).

The company manufactures and markets a wide range of industrial chemicals, a large number of drugs and pharmaceuticals besides cosmetics and home products.

IV. Steps to strengthen the industry

The right product-mix for sustained future growth.

- In the post product-patent regime after 2005 Indian companies will have to increasingly look at merger and acquisition options of either companies or products.
- Improve their R&D efforts and improve distribution to penetrate markets.
- Research and development has always taken the back seat amongst Indian pharmaceutical companies. In order to stay competitive in the future, Indian companies will have to refocus and invest heavily in R&D.
- Needs to take advantage of the recent advances in biotechnology and information technology.

Strengthen forward and backward integration capabilities.



Indian Ports

A port is a geographical gateway to land from sea and from sea to land. For an efficient, economical and safe service the port should have the following essential characteristics.

- (a) Location near fertile and populated hinterlands
- (b) Presence of feeder transport services.
- (c) Convenient and continuous accessibility of ships.
- (d) Hard land and Coast lands.
- (e) Quays and shelter accommodation.
- (f) Provision of sheds and warehouses.
- (g) Sufficient parking and loading and unloading space.
- (h) Dredging facilities.
- (i) Berthage and Mooring facilities.

The port geography of India from a macro-spatial perspective reveals different stages of port evolution with respect to port development model

Stage 1 : Initially the ports are located in a scattered pattern (during historical times).

Stage 2 : There is a landward penetration as each port tries to expand its hinterland and resource base.

Stage 3 : Port Piracy in which a large port captures the area of small port.

Stage 4 : Phase of Congestion.

Stage 5 : Phase of Decongestion.

Stage 1 and 2 of port development model were witnessed during colonial era. New ports like Jawahar Lal Nehru port and Kandla port exhibit the 2nd stage. We can also see port piracy where Kandla and Paradeep are pirating upon hinterland and Kolkata Haldia Port. 12 major ports are pirating the area of 181 minor ports in India. The 4th stage of congestion is common in old ports like Mumbai, Kolkata Haldia, and Chennai. Due to the problem of congestion, economic cost of good transportation is increasing. Mumbai Port has decongested itself into Jawahar Lal Nehru Port. Also Madras Port is decongesting itself to Ennore Port.

Role of Port in National Trade

The role of port in the National Trade is impeded because of inherent obstacles in growth of India's coastal trade. These obstacles are summarized below

- (a) Over aged and outdated vessels.
- (b) Lack of profitable freight rates.
- (c) Competition from Indian Railways.
- (d) Continuous increase in operational expenses.
- (e) Less development of small and intermediate ports.
- (f) Lack of infrastructure facilities at ports.
- (g) Undue delays at the ports.
- (h) Inadequate shipping fleet.
- (i) Lack of financial facilities.
- (j) Indifferent attitude of the government for the development of coastal trade.