



Regional Planning & Development

Geography (University of Delhi)



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UNIT I

DEFINITION OF REGION

To begin with, the terms area, space and region need to be distinguished conceptually over here.

AREA

An area is conceived as a two dimensional geographical terrestrial unit bounded by some kind of administrative or political boundaries defining its limit.

In short an area is simply a certain amount of land.

Eg. A plot of land.

SPACE

Space, on the other hand, could either be finite or infinite / boundless three dimensional extending much beyond the limits of the terrestrial sphere.

The best conceptualization of space visualizes it as a four dimensional space time continuum consisting of three dimensions of space and one dimension of time in recognition of the dynamic nature of space.

It can be finite bounded by some kind of political or administrative boundaries or extending infinitely in the universe.

An area can be space but space cannot be area.

REGION

A region is a finite areal limit bounded by physiographic/ political/ administrative boundaries and having a typical characteristic/ personality of its own.

Region is a dynamic concept which has been defined differently by different geographers.

In the concluding part of the 19th century, the French geographers like **Vidal de La Blache** called the areas of similar physical and cultural characteristics as pays. A more comprehensive and widely acceptable definition of region can be given as “an area having the homogeneity of the physical and cultural phenomena”.

Herbertson (1905) was the first to divide the earth into major natural regions on the basis of climatic parameters. On the smaller scale, geographers attempted to identify individual areas with particular characteristics.

The geographer's main concern is how things are distributed over the surface of the earth, how physical and cultural features of areas are alike or different from place to place, how the varying content of different places came about, and what all these differences and similarities mean for people.

Thus, region is a device of area generalization. It has also been defined as “a differentiated segment of earth surface” (Whittlesey, 1929). The generalization of the features of the earth surface is to make the infinitely varying world around us understandable through spatial (regional) summaries. It is, however, difficult to divide the earth surface into neat regions of uniformity

Attributes of Region:

(i) Regions have location:

All region —physical or cultural—are often expressed in the regional name such as the Middle East, the South-East Asia, the North-West Europe, the Far East, etc.

(ii) Regions have spatial extent:

The homogeneous physical and cultural attributes of the earth surface have spatial (areal) extent. For example, the Thar Desert, the Sahara Desert, the Latin America and Anglo-America cover certain areas of the earth surface. Thus, regions are not in abeyance; they have a personality on the ground.

(iii) Regions have boundaries:

Physical or cultural—has a boundary. The boundary of a region is drawn at the outer edge where the phenomenon (feature) no longer occurs or dominates.

Each region—For example, where the Himalayas and the Shiwaliks end, the Indo-Gangetic plains begin, and where the Gangetic plains end, the Deccan plateau begins. Similar may be the case of the language regions in India. There is a line of demarcation between the Telugu, Tamil and Malayalam regions in India. Similarly, we find the tribal and non-tribal regions in the different states of India. Likewise, at some defined point, urban is replaced by rural, or the rain forest ceases and the savanna emerges. Regions boundaries, are however, not like the walled medieval city.

(iv) Regions may be either formal or functional:

The definition of formal region refers to an area defined by official boundaries.

It may include a city, country, state or even a geographic region.

Functional region: based on functional interaction (Delhi and NCR providing goods and services).

(v) Regions are hierarchically arranged:

Although regions vary in scale, type and degree of generalization, none stands alone as the ultimate key to areal understanding. Each defines only a part of the spatial (regional) reality.

Eg. Upper ganga, lower ganga or national capital then state capital then cities, villages etc arranged hierarchically.

(vi) Regions have transitional boundaries:

Generally, regions do not have sharp boundaries. In most of the cases their boundaries are transitional. It means there is some overlapping of one phenomenon over the other.

TYPES OF REGIONAL PLANNING

Regional planning basically involves the preparations of an integrated plan for land use and settlements in the region specified.

1) FORMAL REGION:

The definition of a formal region refers to **an area defined by official boundaries**. A formal region may include a city, county, state, country, or even a geographic region. Such regions are clearly defined by set boundaries, and are regarded as common or public knowledge.

A formal region is created on the basis of at least one or more of the following characteristics:

Common language

Religion

Nationality

Political affiliation

Culture

Geographical features (climate, vegetation, elevation, landform, etc.)

Formal regions are typically set on the basis of one or more tangible traits which set them apart from the surrounding area. Besides characteristics relating to the local human populace, such as language, income, or religion, formal regions are also created based on physical characteristics, like climate and vegetation. Islands, for instance, are set apart by naturally occurring boundaries, being surrounded by the sea.

Depending on the chosen criteria, a formal region may be easier or harder to define. While terrain features remain fairly steady, if a geographical region is instead based on more mutable human factors (such as language), there could be difficulties in defining the region. As an example, if an

attempt is made to define a neighborhood as an area where more than 50% speaks Spanish, this population could fluctuate throughout the years, necessitating redraws of the region from time to time. Nonetheless, in principle, every formal region is based on some sort of quantifiable variable.

Examples :

Each of the **continents**, and the **countries** within them. For instance, the countries Japan, China, India, and Afghanistan are formal regions situated in the continent of Asia, which is a formal region as well.

Within the United States—New York, Florida, Hawaii, Texas, etc., have official boundaries demarcating them as formal regions. Each **city**, **county**, or **village** also falls under this category.

Physical entities or **geographic zones** like the Rocky Mountains, the Sahara Desert, the Caribbean Islands, or the world's oceans.

In multilingual nations like India or Switzerland, formal regions can be set on the basis of **languages spoken**.

Remember that formal regions can change as the characteristics that define them change. Formal regions can be dynamic in nature, which is to say that, they can undergo modifications according to the changes brought in by political decisions, globalization, or natural shifts in the ecosystem. The only constant is that, these formal demarcations will keep contributing towards helping humans understand and manage their environs and surroundings in an efficient manner.

2)FUNCTIONAL REGION

A functional region is a territorial unit resulting from the organisation of social and economic relations in that its boundaries do not reflect geographical particularities or historical events. It is thus a functional sub-division of territories. The most typical concept used in defining a functional region is that of labour markets

Functional regions are often organized around a central point which is also called node. • The concept of functional region provides a way to examine the linkages and flows that create interdependence among people.

According to Fouberg, Murphy, and de Blij's introductory textbook on human geography (eleventh edition), "a functional region is defined by a particular set of activities or interactions that occur within it."

Regions are defined either as homogeneous regions that share certain characteristics, or as analytical or functional regions that are made up of places that are interdependent, or as administrative regions established to manage certain activities.

Functional regions are defined by their organizational structure. They are also called nodal regions because they usually revolve around a focal center, such as the downtown core of an urban region or the local service area surrounding a library or post office or shopping mall.

The idea of the functional region captures the idea of a territory characterized by spatially related human activities.

The name of "functional region" provides an excellent clue to its definition, it is a region based around a specific activity, a region which has a primary function. Within a functional region there is usually a central hub or point of distribution for whatever function or activity the region is concerned with.

This central hub or focal point is frequently what defines the nature of the functional region, with other buildings and locations popping up in association with the central hub. For instance, a bus depot might be created at the central hub of a transportation network, and more bus routes, stops, and supporting facilities will crop up around/spread out from the initial depot. The focal point of the functional region is where the greatest amount of activity in the region will occur, falling off as one increases in distance from the focal point. People and activity will flow towards and away from the focal point at various times of the day. Although there will be a central hub or focal point for the region, the region as a whole can be considered one unit in regards to the activity it is concerned with.

FUNCTIONAL URBAN REGIONS

From a morphological perspective, a town or urban settlement is defined as a compact built up area with a certain minimum concentration of population; • From an administrative point of view, a town or urban municipality is defined as a territorial unit of local government that contains one or various urban settlements; • Finally a functional criterion defines a town or urban centre as an urban settlement or urban municipality containing a concentration of jobs,

services and other functions that serve other settlements in its hinterland, acting as the core of an urban (functional) region, which is a larger area that contains the urban centre and its hinterland, forming together a socio-spatial system integrated by functional inter-relations.

Examples:

Metropolitan Area

The biggest examples of functional regions are metropolitan areas, and you can think of the city the metropolitan area is based around as of the central hub or focal point of the region. The major city within a metropolitan area is where most commerce and activity takes place, being the most densely populated portion of the functional region. The city or central hub is connected to outlying portions of the region by transport routes, trade routes, and communication. People commute daily from the surrounding area to the city to carry out economic activities within the central club. The urban center that the metropolitan area surrounds may perform many different functions like education, employment, and entertainment.

School Districts

School districts can be thought of as functional regions centered around education. A school district is based on a certain number of schools, which as hubs for the functional region. The different schools and the school district will serve children from the surrounding neighborhoods, based on factors like population and geographical location. The students must commute to their school every day, and a number of different transportation routes link the central hubs (schools) to the homes of the students and surrounding areas.

Department stores and Shopping centres

Department stores and shopping centers are examples of functional regions based on shopping for material goods. A department store will attempt to serve as the primary hub for citizens looking to purchase goods in a surrounding geographical area. The store will target the citizens that live closest to the store, hoping to draw them in, with their customer base reducing as the distance from the store increases. The people who are at the far extremes of the store's range may well choose to go to another department store to get their needed items. The department store is

connected to surrounding homes, businesses, and services by a transportation network and trade routes.

3)PERCEPTUAL REGION

A perceptual region is based on the shared feelings and attitudes of the people who live in the area. Perceptual regions reflect the cultural identity of the people in the region. The boundaries of perceptual regions are not always distinct, as they may be perceived differently from person to person. Perceptual regions are also called [vernacular regions](#).

The Bible Belt, is a perceptual region located primarily in the southern states of the United States. This region is named for the strong religious presence that permeates the culture of the area; there are many Christian and Protestant-based churches throughout the area. The Big Apple (New York City), the Midwest, the South, and New England are other examples of perceptual regions in the United States.

4)PLANNING REGION

Regional planning deals with the efficient placement of land-use activities, infrastructure, and settlement growth across a larger area of land than an individual city or town. Regional planning is a sub-field of urban planning as it relates land use practices on a broader scale.

When one comes to defining regions for planning purposes, administrative convenience assumes paramount importance. This is so because in actual implementations of development plans, the existing administrative boundaries cannot be easily ignored. Infact, it is generally these boundaries that have to be accepted as demarcating the different regions.

However in the enthusiasm of administrative considerations, one must not forget the importance of the factors of homogeneity and nodality, for the neglect of these factors can introduce distortions in the whole planning process. For ensuring proper implementation of development plans, the region should have a fairly homogenous economic structure, some topographical homogeneity, and some socio-cultural homogeneity. Therefore in actual delineation of regions for planning purposes, it becomes necessary to strike a balance between the considerations of homogeneity, nodality and administrative conveniences.

So many definitions of planning region has been given. Perhaps the best definition of a planning region emphasizing the factors of homogeneity, nodality and administrative convenience in a right perspective is the one given by P.D,Malgavkar and B.M.Ghiara:

Geographically, it should be a contiguous unit though it could be subdivided into plain, hilly track, coastal belt, lake area etc.

The people of the region should have social and cultural cohesiveness.

The region should be a separate unit for data collection and analysis.

The region should have an economic existence which can be accessed from statistical records.

It should be small enough to ensure local people's participation in its development.

It should be under one administrative agency.

It should not be too small. Its geographical size should be big enough to exploit resources. This is as much relevant for new investments in capital for production as for technical training, medical facilities, colleges etc. It should be big enough to permit the major part of the labour requirements in any employing centre to be met from within the region.

It should have fairly homogenous economic structure i.e. the variation in local proportion of employment and output in agriculture, industry and services should be within a narrow range .

It should have one or more growth points.

There should be common appreciation of local problems and common aspirations and approaches to their solution; it should permit and encourage competition but not rivalry or apathy between one area and other.

DELINEATION OF PLANNING REGIONS

DELINEATION OF FORMAL REGIONS

In the delineation of formal regions we seek to find out similarities, homogeneity and uniformities in localities on the basis of a specific criterion (or a set of criteria). The localities possessing homogeneity are classified as constituting one region. The criterion or criteria may relate to the physical geography, economic structure or socio-cultural factors. The economic criterion that is most often used is 'per capita income level' and this is combined with some other criteria to introduce more sophistication and realism into the analysis.

There are four methods for delineation of formal regions

Mono-variate method

Fixed index method

Variable index method

Cluster method

1) Mono variate method

The simplest case will, of course, be that in which we consider per capita income only.

For the purpose of illustrations let us assume that **A** and **B** are two localities with per capita income **Y_a** and **Y_b** respectively.

The simplest procedure would be to classify A and B in the same region if $Y_a = Y_b$.

Alternatively, we can include A and B in the same region if $Y_a - Y_b$ is small. Thus, we can prescribe certain definite limits for this purpose (say K) so that if $Y_a - Y_b$ is less than the limits (i.e. $Y_a - Y_b < K$), A and B are included in the same region. And if $Y_a - Y_b$ is greater than the prescribed limit (i.e. $Y_a - Y_b > K$), A and B fall in different regions.

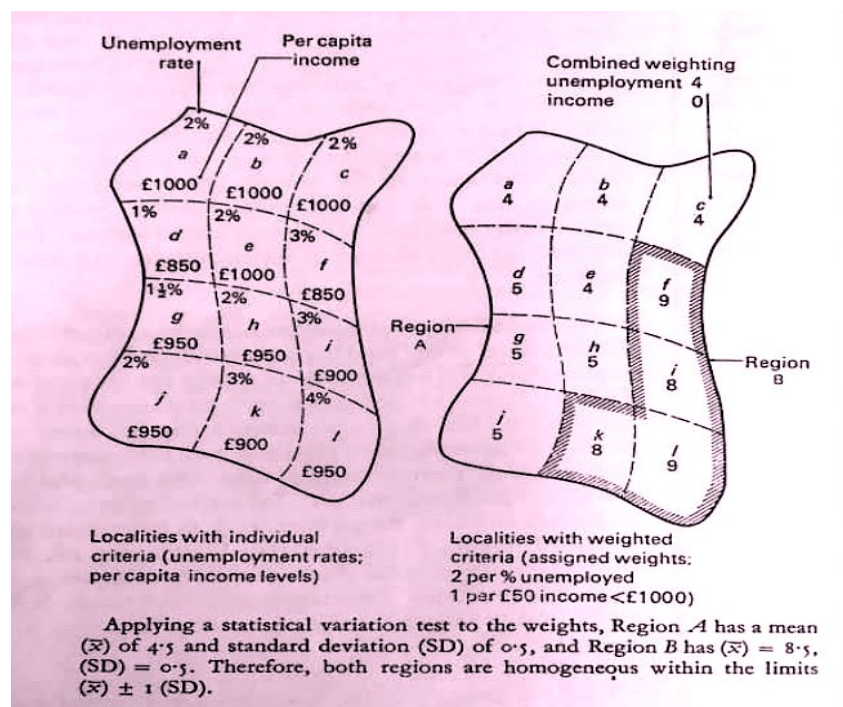
Problem arise when we try to delineate regions by taking into account more than one feature. The issue of assigning weights to different features has also to be faced. The methods that can be adopted are basically three: FIM, VIM, CM.

2) Fixed Index Method

Under the fixed index method, a number of characteristics (indices) common to the regions are chosen; e.g. per capita income, unemployment, rate of industrialization etc.

An arbitrary weight is given to each index and a single weighted mean is obtained for each region.

Then contiguous regions, with similar indices, are grouped together in order to minimize the variance within each group.



3)Variable Index Method

Under the variable index method, variable weights are assigned to highlight different levels of activities in different regions. The weight given to each activity, in each region, is different, in accordance with the value or the volume regionally produced.

For example, if region A is a wheat region and region B is a coal region, the weight of wheat index will be largest in the former and the weight of the coal index will be largest in the latter. This method is good when the criteria can be compared with each other.

4)Cluster Method

In those cases where comparability is not possible (e.g, in the case when one feature is literacy and the other is steel production), it becomes necessary to employ the cluster method. The cluster method is used to detect the homogenous character of the structures of different regional units.

For tracing the clusters, we can take help of mapping techniques wherein interrelated variables are mapped by superimposing techniques.

The study on 'Resource Development Regions' conducted by V.Nath for the planning commission was based on multivariate superposition of natural and physical resources in India.

DELINEATION OF FUNCTIONAL REGIONS

The techniques usually employed in actual delineation of functional regions are

The flow analysis

The gravitational analysis

1)The Flow Analysis

The flow analysis is based on an empirical study of flow data which may refer to different forms of spatial flows such as: intra regional (i.e. within the region) commodity flows; commuting patterns and migration flows (to study movement of people); distribution area of retail and household goods and their relative traffic over different parts of the trade area; freight and passenger movement; telephone communication densities; newspaper circulation area; area served by centrally located social services and leisure facilities.

Each flow will show a decreasing intensity as it becomes more distant from the main centre and an increasing intensity as it approaches another centre. The boundary of area of influence will be where the flow intensity, reaches the minimum.

To highlight the spatial flows, it is usual to construct flow maps since they are in a better position to illustrate actual lines or routes of flows while a tabular presentation does not say anything about the depth along different routes of flows.

However the basic flaw in flow mappings is that they do not give the full story on account of information gaps in flow data (which are present practically in all countries but are present in various serious form in underdeveloped countries). Therefore it becomes necessary to undertake what is known as the gravitational analysis.

2)The Gravitational Analysis

Under this analysis we study the theoretical forces of attraction between centres instead of actual flows as under the flow analysis. The importance of this technique is clear from the fact that it is an instrument to study the potential flows between centres.

In simple terms, the gravity principle merely states that the interaction between two geographical points or areas is directly related to the masses and inversely related to the distance between them. Both the terms mass and distance are, however, difficult to define. For example, mass may be regarded as population or as employment or as income or as economic activity of one type or other. The distance may refer to road distance, airline distance, time distance etc.

Once the mass and distance are defined (depending on the purpose of the study or the value of judgement of the researcher), the gravitational force between two centres i and j expressed as;

$$G_{ij} = \frac{K \{ M_i M_j \}}{(D_{ij})^2}$$

G_{ij} represents the gravitational force between centres i and j , M_i and M_j represents the masses of the centres i and j . D_{ij} is the distance between them, and K is constant.

One of the earliest and a classic application of gravity models was done by W.J. Reilly in his study of retail trade. Reilly's law of retail gravitation is a particular form of general gravitation law and states that 'the force F of attraction (scale of spending in a village of mass M) is proportional to the number of retailers N in town V and inversely proportional to a certain power of the distance D separating the town V from the village.

$$F = K (N/D^2) M$$

In reilly's formulation ? was taken as 2.

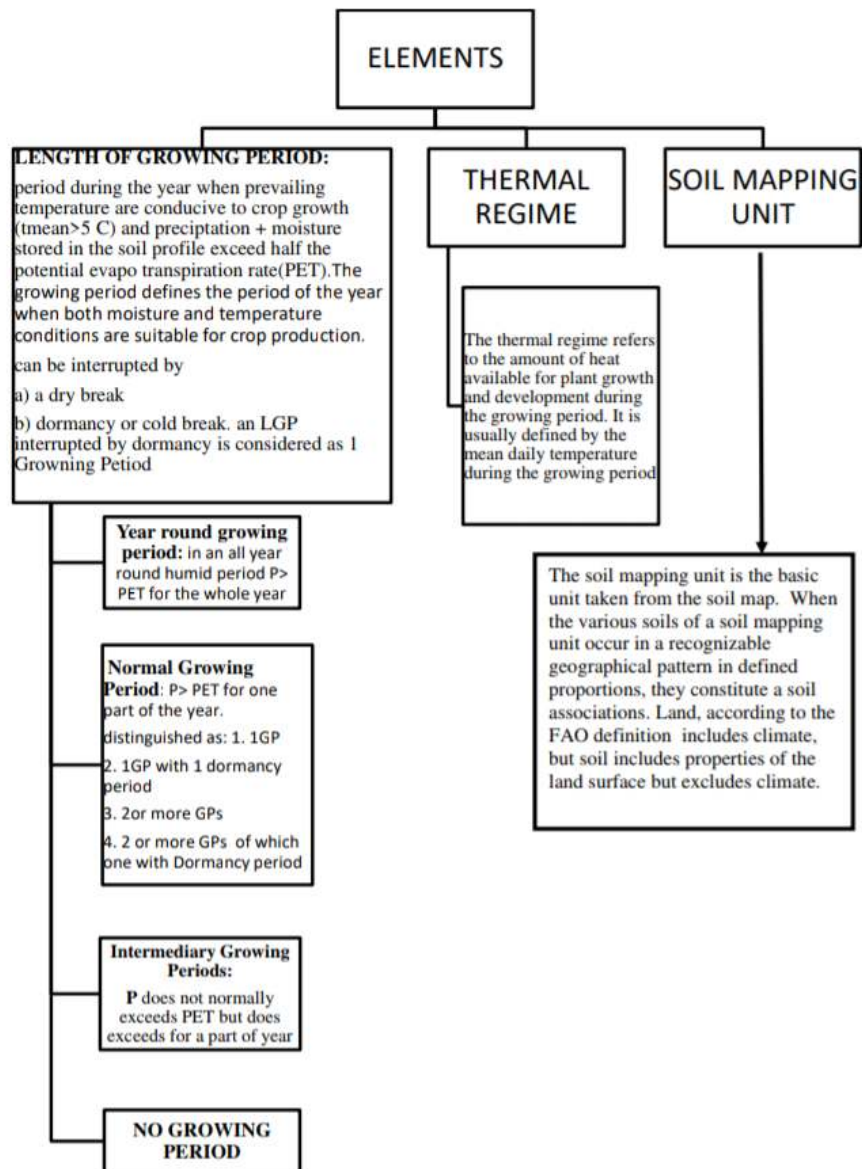
UNIT II

AGRO ECOLOGICAL ZONE

Agro climatic zone is a land unit in terms of major climate, superimposed on length of growing period (moisture, availability period), whereas an agro ecological zone is the land unit carved out of agro climatic zone superimposed on landform which acts as modifier to climate and length of growing period.

An agro ecological cell (AEC) is defined by a unique combination of landform, soil and climate characteristics. The AEC is the basic processing unit for physical analysis in an AEZ only.

The essential elements in defining an agro ecological zone (or cell) are the growing period, temperature regime and soil mapping unit.



The land area of INDIA is divided into 20 agro ecological zones.

ARID

1. Western Himalayas
2. Western plain. Katchh and part of Kathiawar peninsula
3. Deccan Plateau

SEMI ARID

4. Northern Plain and Central Highlands including Aravalis
5. Central (Malwa) highlands, Gujrat Plains, Kathiawar Peninsula
6. Deccan Plateau
7. Deccan (telangana) plateau and eastern ghats
8. Eastern ghats, Tamil Nadu uplands, deccan platteau

SUB-HUMID

9. Northern Plains
10. Central Highlands (malwa, bundelkhand, and eastern satpura)

11. Eastern Plateau (Chattisgarh)
 12. Eastern Plateau (Chotanagpur) and Eastern Ghats
- 3

13. Eastern Plains
14. Western Himalayas

HUMID PER-HUMID

15. Bengal and Assam Plains
16. Eastern Himalayas
17. North Eastern Hills (purvanchal)

COASTAL

18. Eastern Coastal Plains
19. Western Ghats and Coastal Plains

ISLAND

20. Island of Andaman and Nicobar and Lakshadweep

ARID

1. Western Himalayas

Represents J&K and Himachal Pradesh

Cold arid eco region

Shallow skeletal calcareous soil

LGP: less than 90 days

Climate : mild summers severe winters.

Land use: sparse forest trees. Millet, wheat, pulses, barley, major fruit crops.

Constraints : calcareous nature of soils poses nutrient imbalance for normal crop production.
Cryic (very cold) temperature regime.

2. Western plain. Katchh and part of Kathiawar peninsula

Represent Gujarat, Rajasthan, Punjab, Haryana

Hot arid eco region

Desert and saline soil type

LGP: less than 90 days

Climate : mean annual precipitation less than 400mm

Land use: rainfed mono cropping

Constraints : erratic and scanty rainfall-high water deficit

3. Deccan Plateau

Represents AP and Karnataka

Hot arid eco region

Red and black soil

LGP: less than 90 days

Climate : rainfall is erratic and ranges from 400-500 mm

Land use: rainfed farming. Groundnut, sunflower, sugarcane, and cotton intensively grown under irrigated conditions.

Constraints : high runoff and erosion during stormy cloud burst. Prolonged dry spells.

SEMI ARID

4. Northern Plain and central highlands including aravalis

Represents Gujarat, Punjab, UP, MP, Rajasthan

Hot semi arid eco region

Alluvium derived soil

LGP: between 90-150 days

Climate : annual precipitation 500-1000 mm

Land use: 65% region irrigated agriculture

Constraints : coarser soil texture and low plant available water capacity.

5. Central (malwa) highlands, Gujarat plains, Kathiawar peninsula

Represents Gujarat and MP

Hot semi arid eco region

Medium and deep black soil

LGP: 90-150 days a year

Land use: dryland farming, kharif crops

Constraints : intermittent dry spells, salinity and alkalinity

6. Deccan plateau

Represents Karnataka, AP, MP, Maharashtra

Hot semi arid eco region

Shallow and medium black soil

LGP: 90-150 days

Land use: rainfed agriculture

Constraints : prolonged dry spells-crop failure, high runoff

7. Deccan (telangana) plateau and eastern ghats

Represents AP

Hot semi arid eco region

Red and black soil

LGP: 90-150 days

Land use : rainfed agriculture, kharif crops- cotton, rabi-rice

Constraints : deficiency of N,P,Zn in soils results in nutrient imbalance

8.Eastern Ghats, Tamil nadu uplands, deccan plateau

Represents karnatka, TN, Kerala

Hot semi arid eco region

Red loamy soil

LGP: 90-150 days

Landuse : rainfed agriculture

Constraints : high runoff that results in severe soil erosion, nutrient imbalance

SUB HUMID

9.Northern plains

Represents bihar,UP, Punjab

Hot sub humid eco region

Alluvium derived soil

LGP: 150-180 days

Climate : 1000-1200 mm rainfall

Landuse : rainfed and irrigated agriculture

Constraints : an injudicious use of irrigation water may lead to water logging and salinity hazards

10.Central Highlands (malwa, bundelkhand and eastern satpura)

Represents MP and Maharashtra

Hot sub humid eco region

Black and red soil

LGP: 150-180 days

Climate :1000-1500 mm

Landuse : rainfed

Constraints : deficiency of N,P and Zn resulting in nutrient imbalances

11.Eastern plateau (chattisgarh) Represents MP

Hot sub humid

Red and yellow soils

150-180 days

Climate : 1200-1600 mm

Landuse : rainfed farming

Constraints : deficiency in N,P, and other macro nutrients causes nutrient imbalance. Soils are susceptible to severe water erosion hazard.

12.Eastern (chotanagpur) plateau and eastern ghats

Represents Orissa, WB,MP, bihar, Maharashtra

Hot sub humid eco region

Red and laterite soil

LGP: 150-180 days

Cimate : 1000-1600 mm

Landuse : rainfed farming, rice, pulses, groundnut. Tropical dry and moist deciduous forests.

Constraints : soils are susceptible to severe erosion hazard.

Seasonal draughtiness limits

13.Eastern plains

UP, Bihar

Hot sub humid eco region

Alluvium derived soil

LGP:180-210 days

Climate : 1400-1800 mm

Landuse : rainfed agriculture. Cash crops: sugarcane, tobacco

Constraints : flooding and imperfect drainage condition limit soil acration.

14.Western Himalayas

Represents MP, UP, J&K

Warm sub humid eco region

Brown forest and pedozolic soil

Climate : 1000-2000 mm

Landuse : rainfed farming, horticulture plantation

Constraints : severe climate, especially cryic/frigid temperature regime, in northern high altitude permits limited choice of crops.

Soil acidity especially in kangra and manali areas of HP

HUMID PER HUMID

15.Bengal and assam plains

Represents WB and Assam

Hot sub humid to humid eco region

Alluvium derived soil

LGP: 210 days

Climate : 1400-2000mm

Landuse : rice based cropping. Rice and jute main crops under rainfed plantation

Constraints : flooding and waterlogging; excessive leaching of bases and nutrients resulting in low base status in soils, especially in the Brahmaputra (assam) plain

16.Eastern Himalayas

Represents WB, Sikkim, Arunachal Pradesh

Warm per humid eco region

Brown and red hill soil

LGP: 270 days

Climate : 2000 mm rainfall

Landuse : jhum cultivation, cultivation of millets, mustard, rice, potato etc

Constraints : severe climatic conditions restricts the choice of crops.

Steeply sloping landforms encourage heavy runoff resulting in severe erosion hazards

Deforestation for shifting cultivation leads to severe soil degradation problem.

17.North Eastern Hills (purvanchal)

Represents Tripura, Mizoram, Meghalaya

Warm per humid eco region

Red and lateritic soil

LGP: exceeds 270 days

Climate: 2000-3000 mm

Landuse : jhum cultivation, rice dominant crop

Constraints : deforestation and shifting cultivation leads to severe soil erosion

Excessive rainfall leading to leaching results in depletion of nutrients

COASTAL

18.Eastern coastal plains

Represents Tamil Nadu, Puducherry, AP, WB, Orissa

Hot sub humid to semi arid eco region

Coastal alluvium derived soil

LGP: 90-150 days

Climate : 900-1000 mm rainfall

Landuse : rainfed and irrigated agriculture, coconut dominant crop, imp eco activities- raising of coastal and brackish water fisheries

Constraints : soil salinity, prone to cyclone during monsoon, poor drainage limits

19.Western ghats and coastal plains

Represents Kerala, Goa, Maharashtra, Gujarat, Daman and Diu

Hot humid per humid eco region

Red lateritic and alluvium derived soil

LGP: 150-210 days

Climate : exceeds 2000 mm rainfall

Landuse : intensive cultivation- rice, coconut and spices

Constraints : steep slopes, causing runoff, leads to severe soil erosion

ISLAND

20. Island of Andaman and nicobar and Lakshadweep

Represents A&N island and Lakshadweep

Hot humid per humid eco region

Red loamy and sandy soil

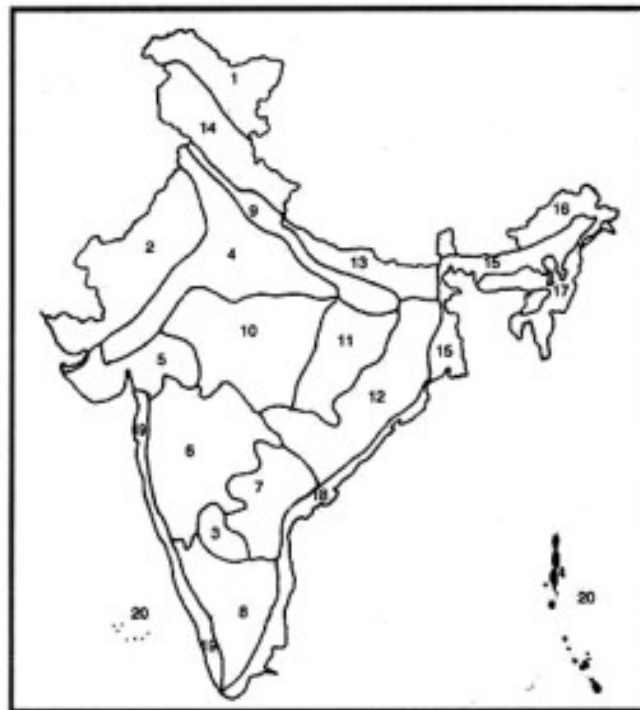
LGP: exceeds 210 days

Climate : 900-1100 mm

Landuse : natural vegetation, littoral and swamp plantation, crop dominant: oilpalm, coconut

Constraints : degradation of the tropical rainforest ecosystem leads to severe soil erosion hazard.

Inundation of coastal areas leads to saline marshes and consequently formation of acid sulphate soils.



Map showing Agro-Ecological Regions.

UNIT III

GROWTH POLE MODEL

The concept of growth pole was developed by the French regional economists, particularly Francois Perroux, in 1995.

Albert O. Hirschman	1955	Strategy of unbalanced growth
John Friedman	1966	Matter of centre versus periphery (Core periphery)

GROWTH POLE THEORY

Francois Perroux

Growth generally does not take place simultaneously at all places but is concentrated in few places. Such places are called growth poles and growth centres. which are dominant, propulsive and have multiplier effect to impact the economy as a whole. According to Francis Perroux, *"growth does not appear everywhere at the same time, it occurs in poles, centres and points with variable intensity. It spreads with different channel with variable terminal effects on the economy as a whole."*

According to this theory, all sectors and all dimensions of economy can't be planned for at the same time and consequence of growth may not spread and impact with same intensity. Perroux was concerned with the phenomenon of economic development and with the process of structural change. He attempted to explain how modern process of economic growth deviated from the stationary conception of equilibrium growth. His arguments were based on *Schumpeter's theories* of the role of innovations and large-scale firms and the theory of inter-industry functional linkages. In Schumpeter's analysis, development occurs as a result of discontinuous spurts in a dynamic world which occurs due to the innovative entrepreneur whose activities take place in large-scale firms. These firms are able to dominate their environment in the sense of exercising reversible and partially reversible influences on other economic units by reason of their dimension and negotiating strength, and by the nature of their operations. Scale of operations, dominance and impulses have close relationship to innovate. A leading propulsive industry has highly advanced level of technology and managerial expertise, high income elasticity of demand for its products, marked local multiplier effects and strong inter-industry linkages with other sectors, without functional interaction spread of growth along different channels is not possible and nor will result in multiplier and propulsive effect. This implies growth centres, is economy specific in nature. Linkage is a concept

developed in regional economics. If a growth in production in one industry stimulates production in the industries supplying it then that industry has *backward linkages*. For example, the steel industry has backward linkages to the iron ore mining industry, the coke and coal industries and the transportation industry involved in transporting those inputs to the steel industry. A *forward linkage* when the availability of the output of an industry make possible the production of industries using that output. For example, the plastic producing industry makes it feasible for businesses requiring plastic to begin operation.

Perroux's idea of an economic space as a field of forces consisting of centres, "from which centrifugal forces emanate and to which centripetal forces are attracted. Each centre, being a centre of attraction and repulsion, has its proper field which is set in the field of other centres." According to growth poles theory the *propulsive pole is a business unit* (a company, industry) or a set of these units. The economic development of a regions depends on the intensity of the propulsive industries on the propelled. All other industries, which lack the strong character, are called *propelled*. This classification then creates polarization of space. Perroux also identified the terms *dominant region* which is the region where poles of development are concentrated, and *dominated region* which is a region where side poles are concentrated. The difference between a growth pole and a growth centre is purely that of scales with former being at larger scales and later on a smaller scale. Growth poles theory identifies 4 basic types of polarization:

- *Technological and technical*: based on the concentration of new technology in the growth pole.
- *Income*: The growth pole contributes to the concentration and the growth of income due

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- Technological and technical: based on the concentration of new technology in the growth pole.
- Income: The growth pole contributes to the concentration and the growth of income due to expansion of services and dependence on demand and profit.
- Psychological: Based on the optimistic anticipation of future demand in the propelled region.
- Geographical: Based on the concentration of economic activity in a geographically determined space.

As according to this concept over a period of time, deglomeration economies start functioning on a pole when it grows excessively due to factors like

- i. Congestion, traffic problems
- ii. High population density
- iii. High prices of land and inputs
- iv. Limitation of the expansion of the market

Hence, the industries start moving towards hinterland. This aspect has led to most of the developing, underdeveloped as well as developed countries of the world to adopt this model for regional planning. To attain a balanced regional development the theory of growth pole suggests that some places in the backward regions must be selected and developed as poles. This actually means creating structural economic disparities deliberately but this will be of worth as the development of growth poles in the backward region will have two effects:

- It will result in higher average income of the region.
- It will send impulses of economic and industrial pulses throughout region by trickledown effect.

Regional and geographical implications of the growth poles theory was proposed by a French economist *Jacques Boudeville* in his modified theory *the theory of growth centers and growth axis*. Boudeville defined a regional growth pole as a "set of expanding industries located in an urban area and including further development of economic activity throughout its zone of influence." The place where these 'expanding' or 'propulsive' or 'dominant' industries are located in the region becomes the pole of the region and agglomeration tendencies are promoted.

There have been proposals which pointed out that the presence of growth poles is not essential for economic growth ie. Switzerland (where tourism is not concentrated in poles but spread all over the country) and Denmark (the prosperity of which was not initiated and maintained due to a large propulsive company). Though the theory of growth pole and growth centres may be successfully applied to attain a balanced regional development.

Pros:

- It uncovers inequalities in the economy of a country (region) and focuses our attention to the propulsive and propelled units.
- It offers a dynamic image of the economy in the country (region) which is based on a general tendency to spatial focus of manufacturing facilities on an interregional level.
- It presents a basis for careful decentralization by supporting the creation of new development poles (focused decentralization or decentralized focus).

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Cons:

- Failing to differentiate between natural and artificial growth pole or between a spontaneously created center and an attempt to affect the center from the outside.
- Implementation of the concept in very different contexts - these being neglected regions, cities to moderate the process of suburbanization as well as achieving the modification of urban structure.
- Underestimation of the critical amount of initial investment to create new growth center.
- An insufficient analysis of the newly founded facility of the propulsive industry.

MYRDAL'S THEORY (CIRCULAR CIRCULATION CAUSATION)

According to myrdal, 'If things were left to market forces unhampered by any policy interferences, industrial production, commerce, banking, insurance, shipping and indeed almost all those economic activities which in a developing economy tend to give a bigger than average return and, in addition, science, art, literature, education and higher culture generally-would cluster in certain localities and regions, leaving the rest of the country more or less in a backwater.'

In myrdal's analysis, the growth in progressive (or advancing) regions affects the growth in lagging (or depressed) regions through i) spread effects and ii) backwash effects.

THE SPREAD EFFECTS: The spread effects are the centrifugal forces of expansionary momentum emanating from the centres of economic expansion to other regions. Thus, the spread effects have positive impact on the development of other regions. Because of the growth in the progressive regions, on the one hand, demand for agricultural products and raw material from other regions is increased, and advanced technology is made available to lagging regions which they did not formerly possess.

In simple terms it is the dispersal of the growth away from poles towards the hinterland.

For Delhi we could argue that suburbs like gurgaon, Faridabad, Ghaziabad etc have benefitted from Delhi's growth due to spread effects.

BACKWASH EFFECTS: Backwash effects are those effects emanating from the centres of growth that discourages growth in other areas. It basically means that if one particular area in a country starts growing or developing, it causes people, human capital as well as physical capital (infrastructure, finance, machines etc) from different parts of the country to gravitate towards this growing centre. It encourages growth of poles at the expense of other surrounding regions (negative impacts). For e.g.

Delhi is developing centre with all companies being set up there. Then people from all over Haryana, Punjab, bihar, U.P. etc have a tendency to move to Delhi because all companies are located there as better employment opportunity exists. So , Delhi will grow but the remaining areas will worse off. This is backwash effect.

Myrdal believes that international and inter-regional economic relations in practice involves unequal exchanges in the sense that the weak is always exploited by the strong. He describes the backwash effects of migration, capital movement and trade in the backward regions. The main cause of backwardness and regional disparities has been the strong backwash effects and weak spread effects. Developing region is developing at a faster rate at the cost of backward regions. Income earned by developing region is not reinvested in backward regions but is repatriated to the developed sectors/regions leading to the more development in these areas. Spread effects continues to become stronger in developed countries while backward effect continued to become even more spread in backward countries.

The development of a region in a balanced manner is an interplay of the above two forces. Relationship between backwash and spread effect:

When backwash effect dominates, divergence will develop; periphery will remain weak, only centre will develop and dualism in growth is promoted.

When spread effect dominates convergence will develop; periphery will develop, there will be economic integration between centre and periphery, propagating a balanced development.

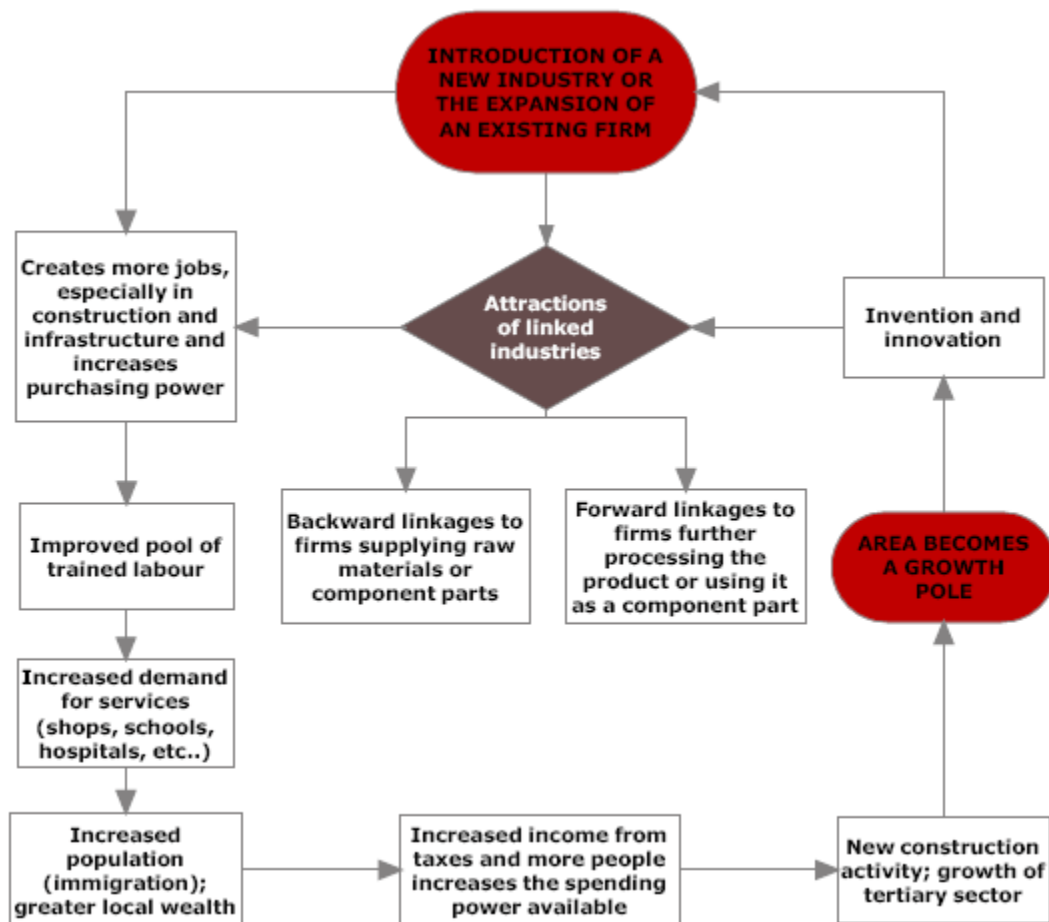
PROS:

- This model combines national and international forces which tend to keep backward countries in morass of cumulative process where poverty becomes its own cause.

- He proved that so called competitive markets, instead of solving the problem of backward region, it would accentuate them.
- Has made important contributions to the theories of convergence and divergence, agglomeration and locational economies and the theory of vicious circle.
- Myrdal was a supporter of balanced growth and wanted it to be initiated, directed and sustained by govt. He was a strong supporter of the theory of sponsored growth.

CONS:

- The theory has been criticized regarding 'accidental factors' as the only factors which start the growth process.
- There are setbacks in developing regions and there can be development in vicious circle region.
- The agglomerating factors (same factors which Myrdal emphasized on) can also bring decreasing returns when diseconomies overcome economies.
- It can also be argued that even market mechanism can reduce inequalities and disparities between two regions.
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WALT WHITMAN ROSTOW THEORY (STAGES OF ECONOMIC GROWTH)

STAGES OF ECONOMIC GROWTH

WALT WHITMAN ROSTOW

Rostow penned his *Stages of Economic Growth* in 1960, which presented five steps through which all countries must pass to become developed. Rostow was fiercely anti-communist and right-wing; he modeled his theory after western capitalist countries, which had industrialized and urbanized. As a staff member in President John F. Kennedy's administration, Rostow promoted his development model as part of U.S. foreign policy. Rostow's model illustrates a desire not only to assist lower income countries in the development process.

Premise:

- Lack of adequate investment.
- The financial gap exists.

Rostow took an historical approach in suggesting that developed countries have tended to pass through 5 stages to reach their current degree of economic development.

These are:

- Traditional Society: This stage is characterized by a subsistent, agricultural based economy, with intensive labor and low levels of trading, and a population that does not have a scientific perspective on the world and technology. This is an agricultural economy of mainly subsistence farming, little of which is traded. The size of the capital stock is limited and of low quality resulting in very low labour productivity and little surplus output left to sell in domestic and overseas markets. This initial stage of traditional society signifies a primitive society having no access to modern science and technology. In other words, it is a society based on primitive technology and primitive attitude towards the physical world. Thus, Rostow defines a traditional society "as one whose structure is developed within the limited production function based on pre-Newtonian science and technology and as pre-Newtonian attitudes towards the physical world".

However, Rostow believes in this stage of a society output could be increasing through the expansion of land area under cultivation or through the discovery and spread of a new crop. But the critical fact about this type of society is that there is limit to attainable output per head. This limit arises due to the absence of access to modern science and technology. This type of a society is characterised by a hierarchical social structure in which there is little possibility for vertical mobility.

The value system that prevails in such a society is called a long-run fatalism. People of these societies think that not much economic progress is possible for them and for their future generations.

- Pre-conditions to take-off: Here, a society begins to develop manufacturing. Agriculture becomes more mechanised and more output is traded. Savings and investment grow although they are still a small percentage of national income (GDP). The people start

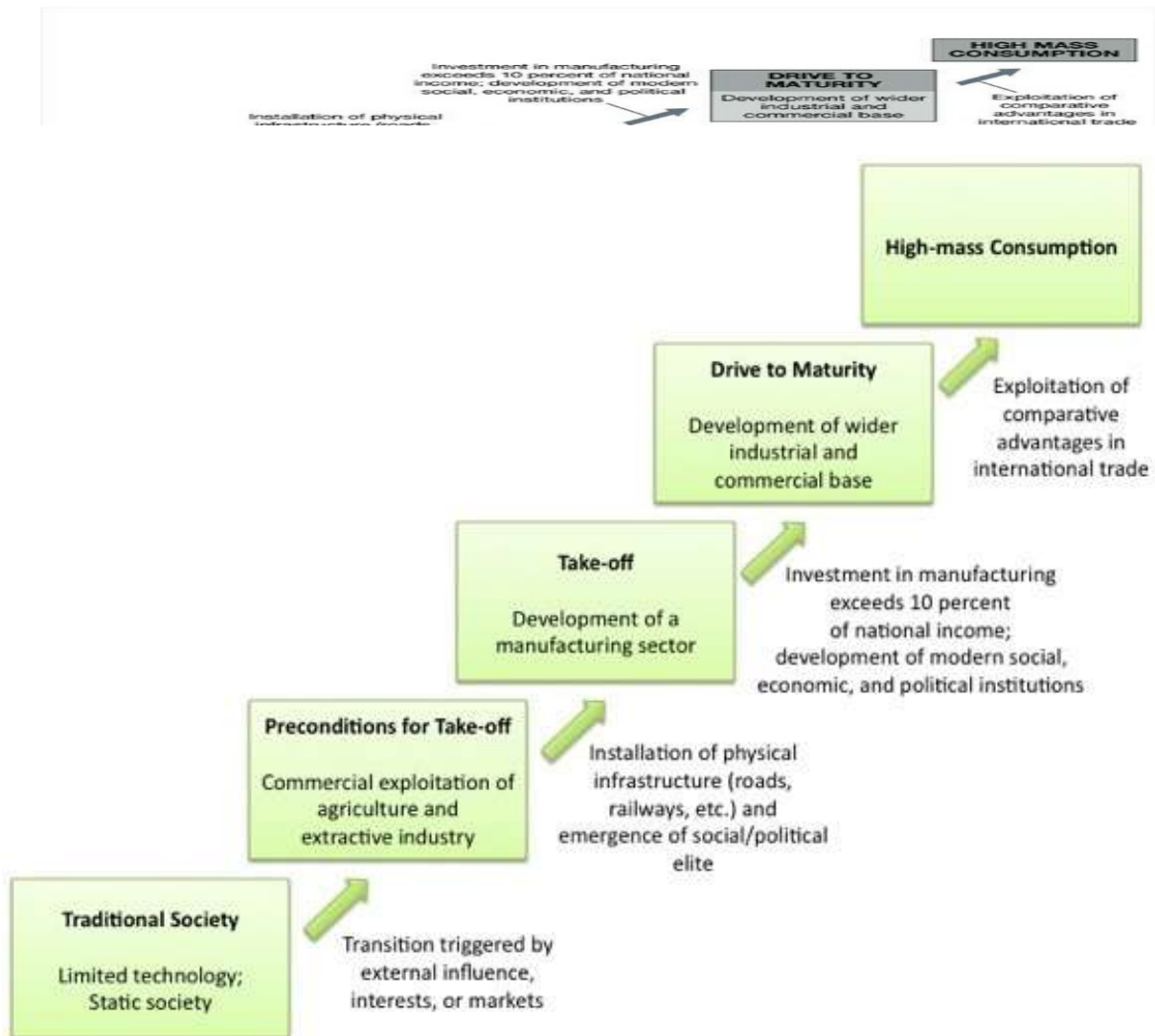
using modern science and technology for increasing productivity in both agriculture and industry, people start viewing the world where there are possibilities of future growth. A new class of entrepreneurs emerges in the society who mobilise savings and undertake investment in new enterprises and bear risks and uncertainty. In the sphere of political organisation, it is during this stage that an effective centralised nation state starts emerging. This covers a long period of a century or more. These conditions mainly comprise fundamental changes in the social, political and economic fields; for example:

- (a) A change in society's attitudes towards science, risk-taking and profit-earning;
- (b) The adaptability of the labour force;
- (c) Political sovereignty;
- (d) Development of a centralised tax system and financial institutions; and
- (e) The construction of certain economic and social infrastructure like railways, ports, power generation and educational institutions. India did some of these things in the First Five Year plan period (1951-56).

HIGH MASS

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- **Take-off:** Rostow describes this stage as a short period of intensive growth, in which industrialization begins to occur, and workers and institutions become concentrated around a new industry. Manufacturing industry assumes greater importance, although the number of industries remains small. Political and social institutions start to develop - external finance may still be required. Savings and investment grow. Agriculture assumes lesser importance in relative terms although the majority of people may remain employed in the farming sector. This is the crucial stage which covers a relatively brief period of two

to three decades in which the economy transforms itself in such a way that economic growth subsequently takes place more or less automatically.

- Drive to Maturity: This stage takes place over a long period of time, as standards of living rise, use of technology increases, and the national economy grows and diversifies. Industry becomes more diverse. Growth should spread to different parts of the country as the state of technology improves, the economy moves from being dependent on factor inputs for growth towards making better use of innovation to bring about increases in real per capita incomes. This stage of economic growth occurs when the economy becomes mature and is capable of generating self-sustained growth. The initial key industries which sparked the take-off decelerate as diminishing returns set in. But the average rate of growth is maintained by a succession of new rapidly-growing sectors with a new set of leading sectors. The proportion of the population engaged in agriculture and other rural pursuits declines, and the structure of the country's foreign trade undergoes a radical change.
- Age of high mass consumption: Rostow believed that Western countries, most notably the United States, occupied this last "developed" stage. Here, a country's economy flourishes in a capitalist system, characterized by mass production and consumerism. Output levels grow, enabling increased consumer expenditure. There is a shift towards tertiary sector activity and the growth is sustained by the expansion of a middle class of consumers. With progressive industrialisation and urbanization of the economy values of people change in favour of more consumption of luxuries and high styles of living. New types of industries producing durable consumer goods come into existence which become the new leading sectors of economic growth.

Criticism:

- Gunnar Myrdal has argued that there cannot be an inevitable sequence of events described as successive stages of growth. According to him, economic growth is the result of certain economic policies adopted and not the other way around.
- Meier argues that stages in the history of economic growth cannot be generalized from the development experience of some European countries as Rostow has done. Although a particular sequence may correspond broadly to the historical experience of some economies, no single sequence fits the history of all countries.
- Simon Kuznets argued that many countries which have now reached developed status did so without seeing a significant increase in their savings rate.
- When the external finance has come in the shape of loans from developed countries, interest charges have been incurred which have acted as a drag on economic growth.
- Some Sub Saharan African countries have received significant external finance but have been slow to generate growth - many have remained stuck in Stages 1 or 2.

JOHN R. FRIEDMANN THEORY (MATTER OF THE CENTRE VERSUS THE PERIPHERY)

MATTER OF THE CENTER VERSUS THE PERIPHERY

John R. Friedmann

Friedman developed the idea in analyzing the relationship of the interior regions of Venezuela to the coastal regions. The idea of core and periphery is very simple and is similar to growth-pole theory by Francois Perroux. It states that *some areas develop faster because of human and physical advantages and turn into the core and other areas that lack human and physical advantages become the less important periphery.*

Assumption: Economic growth does not occur everywhere at once, but in poles of growth.

The conventional core-periphery model of development represents the emergence of a regional urban system in four major stages which goes on par with the development of regional transport systems from an initial process of spatial inequalities. According to this concept, the economic development is then the resultant of acting of driving units on driven units. The model states that as core regions develop it is necessary for them to exploit the peripheries. This might be in terms of net migration gain or exploitation of resources i.e. during the colonial period, Western Europe developed as a core region and exploited many of its colonies in Africa, Asia and South America. The theory is centre periphery model because:

- the favourable effects flow from centre to periphery. Periphery supplies raw material and human power to centre.
- centre supplies finished output for consumption and input.

The growth poles can be developed and operated on the basis of different reason:

- i. Technological and technical polarization: based on the concentration of new techniques and technologies in the poles of growth;
- ii. Income polarization: in the pole of development the population has sufficient incomes (pensions) which leads to the expansion of services (as they are demanded by buying population).
- iii. Psychological polarization: is based on optimistic expectations of future demand driven in the driving area. Similar to the polarization of income, but income is, only expected, not real.
- iv. Geographic polarization: based on the concentration of economic activity in a certain geographically delimited territory.

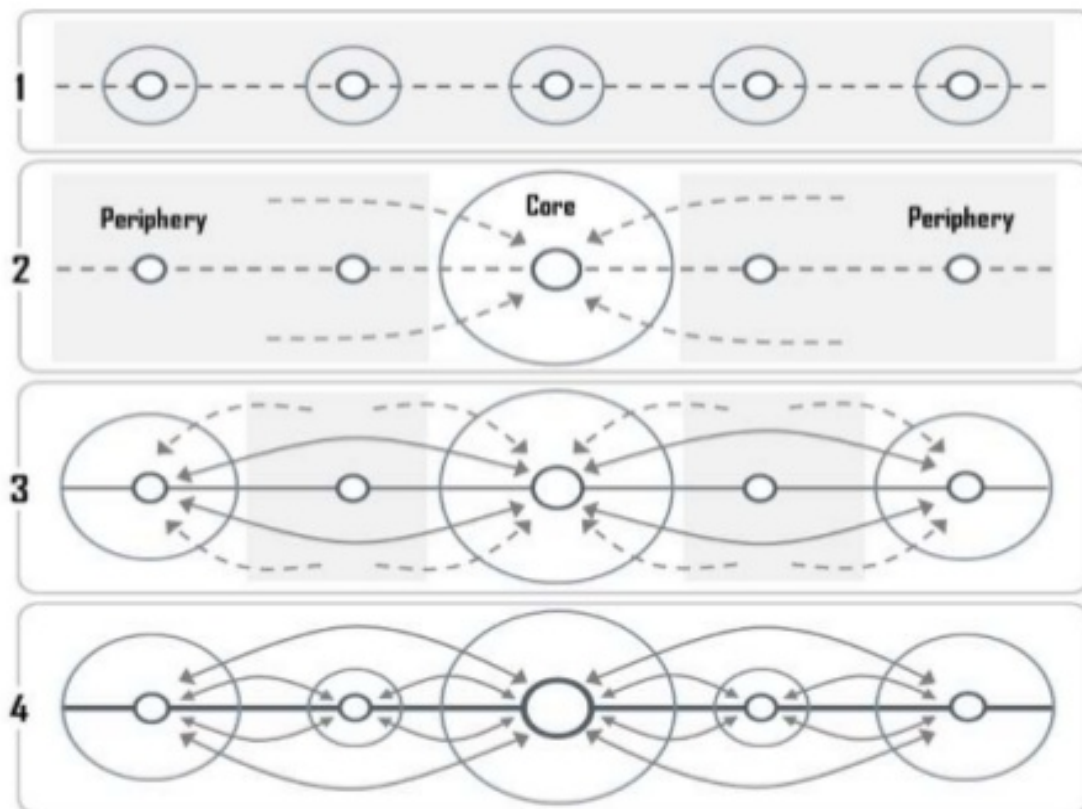
According to the hierarchy, poles can be divided into the following types:

- i. Central cities – small and medium-sized cities, which focus primarily on the development of the tertiary sector;
- ii. Growth poles – industrial cities with a diversified economic structure, their growth is however generated by exogenous factors;
- iii. Development poles – large urban agglomerations with diversified economic structure and with the presence of propulsion industries, causing the autonomy of their growth;
- iv. Integration poles – growth zones, occupied by two or more urban systems and cause evolution of the spatial structure of the country.

Influence of the core regions on the peripheral ones is different in the short and long-term period. In the short term, it is negative. The core region due to the concentration of companies pumps resources from the peripheral region. The peripheral region near the center therefore has no possibility of excessive development and is still behind. In the long term, however, the core extends to the periphery, the demand for raw materials and labor force from the peripheral regions increases (the condition is good transport connection). Exceeding the absorption capacity of the core region leads to the location of new economic capacities in the peripheral regions. Periphery can become a part of the core or it arranges concentrated service activities for companies, directly making benefits from the development of core.

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Stages of development in Core-Periphery theory:

- **Pre-industrial Stage:** The pre-industrial (agricultural) society, with localized economies and a small-scale settlement structure. Each settlement is fairly isolated, activities are dispersed and mobility is low.
- **Transitional Stage:** The concentration of the economy in the core city begins as a result of capital accumulation and industrial growth, probably because it has more physical or human resources. Trade and mobility increase, but within a pattern dominated by the core even if the overall mobility remained low.
- **Industrial Stage:** Through a process of economic growth and diffusion, new smaller cores (semi-periphery) start to develop and there is an increase in flows between the core and the semi-periphery.
- **Post-industrial Stage:** The urban system becomes fully integrated and spatial inequalities are reduced significantly. The dominant poles emerge as large commercial gateways, usually a world city.

Criticism:

- Over time economic disparities have widened rather than converging as the exchange-based models predicted
- Some of the nations have become independent from colonial rule but they are still dependent for their development on modern First World countries like United States, Britain, etc. For him, development is a myth which obscures the reality of exploitation the capitalist powers have never seriously intended to give up their economic domination over their erstwhile colonies. Dependent states are merely satellites

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- Technological advances are likely to occur only in the core because of the superior infrastructure present, which maintains the core countries' structural advantage. Consequently, the core is often described as the exploiter and the periphery as exploited resulting in underdevelopment.
- The theory is criticized for the use of static categories that do not adequately reflect complexities and variations on the ground. Although the terms core and periphery imply that discrete categories exist that are homogeneous within them and heterogeneous between them, in reality it is better to think of a continuum that flows between each level in these geographic models.

ALBERT O HIRSCHMAN THEORY (THEORY OF UNBALANCED GROWTH)

THEORY OF UNBALANCED GROWTH

ALBERT O. HIRSCHMAN

The strategy of unbalanced growth is most suitable in breaking the vicious circle of poverty in underdeveloped countries. According to Hirschman, "Development is a chain of disequilibria that must be kept alive rather than eliminate the disequilibrium of which profits and losses are symptoms in a competitive economy. If economy is to keep moving ahead, the task of development policy is to maintain, tension, disproportions and disequilibria." He asserts that industries with maximum linkages ought to be developed first, investment in these selected industries or sectors would accelerate the pace of economic development.

Premise:

- The degree of technical complementarity is different among the industries. Therefore, the programme for economic development should aim at the establishment of those industries where these complementarities happen to be the greatest.
- Simultaneous investment in a number of complementary industries according to the programme of balanced growth may achieve a once for all increase in national income. But after this, the economy will become stabilized at a higher level without any movement forward.

The poor countries are in a state of equilibrium at a low level of income. Production, consumption, saving and investment are so adjusted to each other at an extremely low level that the state of equilibrium itself becomes an obstacle to growth. The only strategy of economic development in such a country is to break this low-level equilibrium by deliberately planned unbalanced growth. The objective of development is not only to achieve a once for all increase in national income, rather this process of income

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To create these imbalances Hirschman suggests investment either in Social Overhead Capital (SOC) "comprising all those basic services without which primary, secondary and tertiary productive activities cannot function". This includes investment in education, public health, transport and communications, irrigation, drainage etc. Large investment in SOC will encourage investment in Directly Productive Activities (DPA) by providing cheap inputs to agriculture and industry e.g., cheap electricity and power supply may encourage the development of industries both large and small and may stimulate activity in other sectors as well. Expansion in investment in DPA without the corresponding expansion in SOC will lead to increase in cost of production in view of inadequate availability of overhead facilities. In such a situation, pressures are likely to be exerted and the

government may step in and undertake investment in SOC for creating the necessary infrastructure which would lead to an all-round development of the economy.

Pros:

- Realistic Theory: The theory of unbalanced growth is a realistic theory. The theory suggests appropriate utilization of the scarce resources in less developed countries. The theory considers all aspects of growth planning.
- More Importance to Basic Industries: The theory underlines the significance of basic industries in the process of growth. This will automatically press for the growth of consumer-goods industries.
- Economies of Large Scale Production: The strategy of unbalanced growth generates economies of large scale production. Establishing key industries calls for the establishment of ancillaries, generating all round increase in income and employment. Encouragement to New Inventions: Unbalanced growth generates pulls and pressures in the system, calling for new inventions and innovations.
- Self-reliance is the under-current of the theory of unbalanced growth. It starts with the realistic assumption of chronic scarcity of resources in less developed countries and contemplates to initiate and accelerate the process of growth in accordance with the needs and means of the country concerned.
- Economic surplus: The strategy of unbalanced growth is expected to generate greater surplus in the system. This is because of its emphasis upon the capital-goods industries. This strategy is also expected to produce a very strong multiplier effect in the system, stimulating income and employment.

Criticism:

- Inflation- The theory gives undue emphasis to development through industrialization, notwithstanding the significance of agriculture. Because of long gestation lags in industries, flow of goods is expected to be constricted during the short period, causing inflation.
- Wastage of Resources- Being concentrated on a couple of industries, resources may not

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 - Wastage of Resources- Being concentrated on a couple of industries, resources may not be appropriately utilized. Some sectors of the economy will grow at a faster rate while other sectors will remain neglected.
 - No mention of obstacles- The theory only mentions the establishing key industries presses for the establishment of other industries. But the theory is oblivious to the possible difficulties in establishing key industries to begin with. It is not an easy task to establish key industries right at the beginning of a development programme.
 - Increase in uncertainty- The theory inherently assumes that the success of the growth process depends on external trade and foreign aids. This increases uncertainty of the growth process.
 - Unbalance is not necessary- The critics are of the opinion that deliberately introducing unbalances in the system is not so much needed in the less developed countries. These imbalances are caused on their own due technical indivisibility and uncertain behaviour of demand and supply forces.
-
- Neglect of the degree of unbalance- How much to imbalance and where to imbalance are not known by the theory of unbalanced growth. It only tells of the need to imbalance.
 - Linkages effect are not based on empirical data- Prof. Hirschman has advocated to start only those industries that have maximum linkages effect. But these effects are not based on statistical data pertaining the less developed countries.
 - Lack of basic facilities- 'Unbalanced Growth Theory' assumes the availability of certain basic facilities in terms of necessary raw materials, technical know-how and developed means of transport. However, in less developed countries mostly these are insufficient.

UNIT IV

CHANGING CONCEPT OF DEVELOPMENT

The concept of development is not very old. It came in currency only by the second half of the preceding century perhaps only when the most of the present day less developed countries emerged as independent nations after their long subjugation to colonial rule and set out on the path of their own planned economic progress.

Development, like modernization, is a concept, which was used to analyze the level of social, economic and political progress in colonial countries on the lines of progress attained by the west after the renaissance and the Industrial Revolution.

Social, political and economic changes that took place in western Europe became the parameters of development and modernization to access the level of progress made by the developing countries on this path.

That is why, though Adam's Smith Wealth of Nation is treated as the first treatise on development economies, a systematic study of development began only in the middle of the 20th century when problems of developing countries attracted attention of economists and other social scientists.

Development, therefore emerged as a relative concept which presupposed a comparison of the less developed countries of Asia, Africa and Latin America with the developed countries of the west. There has been periodic paradigm shift in the concept of development ever since its inception in academic writings.

This shift has been in correspondence with the changing experiences of development in the less developed countries and the ideological approach of looking at development and progress in society.

Below are various perspectives on development and the changes made over time:

ECONOMIC GROWTH PERSPECTIVE

In the writings of early economists, the concept of development, as we define today, is missing. These writings have confined themselves to what we treat as economic growth and explained the concept only rationally and in economic terms.

The progress could be measured in terms of per capita income, GNP, and the number of functioning industrial units. They looked at development from this angle, and referred essentially to the successive growth in material and manual forces of production like land, labour, capital and technology.

The theory of economic growth vary in their views but there are four common points in them which explain the laws of economic growth:

- 1.the accumulation of capital and improvement of technology
- 2.population change
- 3.the division of labour into specialized activities and
- 4.entrepreneurship

Adam smith, writing in the beginning of 18th century, propounded the first systematic theory of economic growth. According to him invention of better machines is responsible for increase in productivity and material welfare.

The classical economics stressed upon development in terms of economic growth and believed that if annual growth is at the rate of 5 to 6 percent, it should be treated as a developing economy.

Adam smith and David Ricardo were of the view that an increase in population growth would reduce the rate of economic growth. But, later on, English economist John Maynard Keynes' theory rejected the thesis of Smith and Ricardo and stressed that an increase in population increases demand for goods, which stimulates investment and ultimately economic growth.

The last two decades of economic achievements of China and India-the two most populous countries of the world-have also proved that population explosion is perhaps not necessarily a detrimental force in economic development.

Accumulation of capital and economic growth lead to division of labour and vice versa. Smith emphasizes the role of division of labour in the increase in production.

Entrepreneurship – a key factor in economic growth- was in fact not recognized in the early economics.

HUMAN DEVELOPMENT PERSPECTIVE

The concept of human development has its origin in the writings of early economists like Adam Smith, David Ricardo, Robert Malthus etc. It is the UNDP, which revived the concept in human development report 1990.

Economic growth may not be termed as realistic and down to earth development as the growth of wealth would not necessarily ensure that nobody would really be hungry. Human development broadly refers to improvement in the overall human well being.

This helps in realizing that there is no automatic relationship between the growth of GNP and improvement in the quality of life. China, India and Pakistan have similar GNP level but HD performance of China is much better than the other two countries.

The indicators which have been identified to measure the level of human development include:

- | | | |
|--------------------|-------------------|--------------------------|
| i) life expectancy | ii) literacy rate | |
| iii) birth rate | iv) death rate | v) infant mortality rate |

India's position is very bad as it ranks 127th among 177 countries.

SOCIAL DEVELOPMENT PERSPECTIVE

The concept of social development gained currency at the time when the third world countries started to strive for economic development. The scholars and agencies like UNO, working on the problems of development in the developing countries, realized that these countries due to prolonged colonial subjugation were left with sad social and economic conditions at the time of independence and were far away from modern values.

Therefore, what was required of these countries was to adopt policies and planning for the social development. Social development is a broad concept which refers to the development of a society as a whole.

Social development and economic development are mutually complimentary processes. The concept 'social' consists of all non economic factors. Social development is a pre condition for economic development.

SUSTAINABLE DEVELOPMENT PERSPECTIVE

By the end of 70s of the last century, it was realized that the nature and extent of development, as was conceived and being pursued, would harm more than help the mankind.

The backwash effect of the blind race in achieving the kind of development as is done so far emerged in the form of ecological imbalance, environmental degradation and pollution of water and air.

These alarming conditions forced scholars to contemplate about an approach to development which would minimize these threats. This led to the emergence of the concept of sustainable development. There must be a limit to economic growth.

The 'green movement' arose world over and people became concerned about environmental problems and started conserving and protecting the natural resources and animal species.

Economic development without considering its impact on environment and adopting measures to protect it from ill-effects of development would be fatal for the human society.

CONCEPT OF UNDERDEVELOPMENT

Criterion for Classifying Economies as Developed and Underdeveloped

Economies cannot be classified as developed and underdeveloped economies based on their natural resources, population and sectoral dependency. However, there is a set of common characteristics of underdeveloped economies such as low per capita income, low levels of living, high rate of population growth, illiteracy, technical backwardness, capital deficiency, dependence on backward agriculture, high level of unemployment, unfavourable institutions and so on. It is on the basis of these characteristics that we draw a line of distinction between developed and underdeveloped economies.

Meaning and Definition of Underdevelopment

Underdevelopment is low level of development characterized by low real per capita income, wide-spread poverty, lower level of literacy, low life expectancy and underutilisation of resources etc. The state in underdeveloped economy fails to provide acceptable levels of living to a large fraction of its population, thus resulting into misery and material deprivations. We need to note here that *underdevelopment is a relative concept but it sustains absolute poverty.*

Underdevelopment is a Relative Concept

The concept of underdevelopment is a relative one because it is the comparison of quality of life between the economies that differentiates them in underdeveloped and developed.

Underdevelopment Sustains Absolute Poverty

Although, concept of underdevelopment is a relative concept but it sustains absolute poverty. Absolute poverty refers to the state of poverty wherein the people fail to fulfil even their basic needs in terms of food, clothing and shelter. In fact, they are a class of people who are always striving to survive. Thus, underdevelopment and absolute poverty go together or underdevelopment sustains absolute poverty.

Characteristics of Underdeveloped Economies

It is difficult to find an underdeveloped economy representing all the representative characteristics of underdevelopment. While most of them are poor in nature, they have diverse physical and human resources, socio-political conditions and culture. Some of the common characteristics displayed by most of the underdeveloped countries in the world are as follows:

Low Per Capita Income

Almost all underdeveloped countries of the world show low per capita income in comparison to developed countries of the world.

Slow Growth Rate of Per Capita Income

Low per capita income and slow growth rate of per capita income are characteristics of these countries.

Economic Inequalities

High inequality of income and wealth is another common feature of underdeveloped countries. In these countries, large percentage of national income is shared by a small segment of the society while a large segment of the society gets barely enough to survive. Economic inequality exists even in developed countries but it is not as much as found in underdeveloped countries.

Low Level of Living

Level of living in the underdeveloped countries is low because of low per capita income. Low level of living of the people of underdeveloped countries is also reflected in Human Development Index prepared by the United Nation Development Programme (UNDP). HDI of developed countries is very high whereas for underdeveloped countries it is very low.

Low Rate of Capital Formation

Rate of capital formation is very low in underdeveloped economies due to low income levels and high incidence of poverty.

Backward Techniques of Production

Underdeveloped economies use outdated technology for production. Lack of capital leads to less spending on research and development.

High Growth Rate of Population and Dependency Burden

These countries are characterised by high growth rate of population and high dependency burden.

Low Productivity of Labour

Underdeveloped economies are characterised by low labour productivity due to low level of skill set.

Underutilisation of Natural Resources

Natural resources are underutilised in underdeveloped economies. Their capability to exploit them is very low.

Large Scale Unemployment

Large scale unemployment is another characteristic feature of underdeveloped countries.

Dominance of Agriculture

Large section of people in underdeveloped economies depends on primary sector for employment. But the primary sector is not well-developed in those countries.

High Incidence of Poverty

Low per capita income results in high incidence of poverty in underdeveloped economies.

Infrastructural Backwardness

Economic infrastructure and social infrastructure are almost at their bottom level in underdeveloped countries.

Low Volume of Foreign Trade

Underdeveloped countries export primary products like, agricultural goods, minerals, petroleum oil, etc., and import finished products, especially consumer goods. Terms of trade are grossly unfavourable to underdeveloped countries.

Efficiency is concerned with the optimal production and allocation of resources given existing factors of production. For example, producing at the lowest cost.

Equity is concerned with how resources are distributed throughout society.

An equity-efficiency tradeoff results when maximizing the productive efficiency of a market leads to a reduction in its equity—as in how equitably its wealth is distributed. Debate around the tradeoff often focuses on addressing growing economic inequality within a country or region where the economy and GDP are growing. The concern for some is that the least affluent members of society receive an disproportionately small share of the increasing wealth. Academic discussion of equity-efficiency revolves in part around whether equity and efficiency are always inversely related or whether they can both rise at once.

UNIT V

Development is a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components. The purpose of development is a rise in the level and quality of life of the population, and the creation or expansion of local regional income and employment opportunities, without damaging the resources of the environment. Development is visible and useful, not necessarily immediately, and includes an aspect of quality change and the creation of conditions for a continuation of that change.

The international agenda began to focus on development beginning in the second half of the twentieth century. An understanding developed that economic growth did not necessarily lead to a rise in the level and quality of life for populations all over the world; there was a need to place an emphasis on specific policies that would channel resources and enable social and economic mobility for various layers of the population.

Through the years, professionals and various researchers developed a number of definitions and emphases for the term “development.” Amartya Sen, for example, developed the “capability approach,” which defined development as a tool enabling people to reach the highest level of their ability, through granting freedom of action, i.e., freedom of economic, social and family actions, etc. This approach became a basis for the measurement of development by the HDI (Human Development Index), which was developed by the UN Development Program (UNDP) in 1990.

INDICATORS

Usually a numerical measure of quality of life in a country.

Indicators are used to illustrate progress of a country by meeting a range of economic, social, and environmental goals. Since the indicators represent data that have been collected by a variety of agencies using different collection methods, there may be inconsistencies among them.

QUANTITATIVE INDICATORS

Quantitative indicators are numerical indications of development.

Social indications include access to clean water and sanitation (which indicate the level of infrastructure developed in the country) and adult literacy rate, measuring the resources the government has to meet the needs of the people.

Demographic indicators include the birth rate, death rate and fertility rate which indicate the level of industrialization.

Health indicators (a sub-factor of demographic indicators) include nutrition (calories per day, calories from protein, percentage of population with malnutrition), infant mortality and population per doctor, which indicate the availability of healthcare and sanitation facilities in a country

Environmental indications include how much a country does for the environment.

COMPOSITE INDICATORS

Composite measures include the PQLI (Physical Quality of Life Index) which was a precursor to the HDI which used infant mortality rate instead of GNP per capita and rated countries from 0 to 100. It was calculated by assigning each country a score of 0 to 100 for each indicator compared with other countries in the world. The average of these three numbers makes the PQLI of a country.

The HPI (Human Poverty Index) is used to calculate the percentage of people in a country who live in relative poverty. In order to better differentiate the number of people in abnormally poor living conditions the HPI-1 is used in developing countries, and the HPI-2 is used in developed countries. The HPI-1 is calculated based on the percentage of people not expected to survive to 40, the adult illiteracy rate, the percentage of people without access to safe water, health services and the percentage of children under 5 who are underweight. The HPI-2 is calculated based on the percentage of people who do not survive to 60, the adult functional illiteracy rate and the percentage of people living below 50% of median personal disposable income.

The GDI (Gender-related Development Index) measures gender equality in a country in terms of life expectancy, literacy rates, school attendance and income.

QUALITATIVE INDICATORS

Qualitative indicators include descriptions of living conditions and people's quality of life. They are useful in analyzing features that are not easily calculated or measured in numbers such as freedom, corruption, or security, which are largely non-material benefits.

SOCIAL INDICATORS

Social indicators are defined as statistical measures that describe social trends and conditions impacting on human well-being. Generally, social indicators perform one or more of three functions:

- providing information for decision-making
- monitoring and evaluating policies
- and/or searching for a common good and deciding how to reach it.

OBJECTIVE SOCIAL INDICATORS

Objective social indicators represent social facts independently of personal evaluations. Examples include: unemployment rate, poverty rate, working hours per week, pre natal mortality rate.

SUBJECTIVE SOCIAL INDICATORS

They are based on individuals' perception and evaluation of social conditions.

Examples include: life satisfaction, job satisfaction, etc

The common man is considered to be the best expert to evaluate his quality of life. The most important measures of subjective well being are happiness and satisfaction.

SOCIAL INDICATORS:

- 1) **EMPLOYMENT:** Employment is an economic element that is closely related to the stage of development in a particular country. The higher the rates of employment are, the stronger the economy of the state is. High employment rates indicate that a country has well functioning policies for the benefit of the public. If the rates of unemployment are dropping, the country is developing in a positive direction. For example, recent reports from 'the economist' highlight that increasing rates of employment can be observed in Africa, which indicates that the African states are undertaking a positive course of economic development.
- 2) **EDUCATION:** Education is the most important social factor indicating the state of countries' development. Through education, individuals become specialists within specific areas and contribute skills and

expertise to the economy and some particular branches of national production. Hence the economy grows because there is no lack of skilled labour, and the state develops in a positive direction. For example, higher education in china is becoming more popular among young people, which indicates that the country is developing and producing its own specialists, without the need to import skilled labour from other countries.

- Gross enrolment ratio: is defined as total number of students enrolled in a given level of education, regardless of age. It is expressed as percentage of the official school age population relative to the population of the age group which officially corresponds to the given level of education.
- Net primary enrolment ratio: Net primary enrolment ratio is the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in primary school to the total population of children of official school age.
- Youth literacy rate: Literacy rate of 15–24 year olds, or the youth literacy rate, is the percentage of the population 15–24 years old who can both read and write with understanding a short simple statement on everyday life. In India, a person aged 7 years and above who can both read and write with understanding in any language has been taken as literate. It is not necessary for a person to have received any formal education or passed any minimum educational standard for being treated as literate.

3) **ECONOMIC GROWTH**: Economic growth is the growth in the economy of a state for a particular period of time. It is essential for measuring the rates of development of countries, since it indicates whether there are persistent economic problems or if the state has an opportunity for a steady economic advancement. For instance, data provided by Bloomberg.com indicates that germany has become the most attractive place for investment in Europe, due to its immense and steady economic growth.

4) **STANDARD OF LIVING**: It indicates the current stage of development of a state. It is linked with the economy and the social well being. If the economy is strong, it ensures a high standard of living and potential for further development. For example, Norway is among the countries with highest standard of living. It is among the European states with the highest income per person and the Norwegian people are considered among the happiest populations in the world.

5) **HAPPINESS INDEX:** It's an indexation of happiness based on survey results, that was first used in the 2012 World Happiness Report. In the survey, the respondents were asked to rate their happiness on a scale from 0-10. The happiness Index is calculated by averaging the survey results of the respondents.

The definition of the Happiness Index originates from the Bhutanese Gross National Happiness Index. In 1972, Bhutan started prioritizing happiness over other factors such as wealth, comfort and economic growth. They created an indexation for happiness based on multiple measurable factors, and have kept track of this index ever since.

This inspired the Happiness Council to devise their own definition of the Happiness Index, which was coined in the 2012 World Happiness Report.

The key variables of the happiness index are:

GDP per capita

Social support

Healthy life expectancy

Freedom to make life choices

Generosity

Perceptions of corruption

There is a positive correlation between happiness index and development. Higher happiness index index more economic development. Most of the developed countries have high happiness index.

Highest happiness index is of Finland and lowest being of South Sudan.

6) **THE GENDER INEQUALITY INDEX:** The United Nations defines the Gender Inequality Index as 'A composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labour market'.

More specifically, it gives countries a score between 0-1 (similar to the HDI) based on:

- The Maternal mortality ratio: Number of deaths due to pregnancy-related causes per 100,000 live births.
- The Adolescent birth rate: Number of births to women ages 15–19 per 1,000 women ages 15–19.
- Proportion of seats held by women in the national parliament expressed as percentage of total seats.
- The proportion of the female population compared to the male population with at least some secondary education
- The comparative Labour force participation rate for men and women.

Selected countries according to their rankings for the Gender Inequality Index

- 1st – Slovenia
- 11th – Finland
- 39th – The United Kingdom
- 55th – The United States
- 56th – Saudi Arabia
- 97th – Bhutan
- 127 – Ghana
- 130th – India

The obvious strength of this is that we get to compare the life chances of women in a country to those of men. What's (maybe) surprising is that while there does appear to be a general correlation between high GNI per capita (PPP), high human development and low gender inequality, the correlation is not perfect: as is evidenced by the USA being just one place above Saudi Arabia and Ghana being just a few places above India, despite these two pairs of countries having quite divergent levels of 'human development'.

ECONOMIC INDICATORS

International organizations such as the World Bank prefer to measure development using economic indicators.

- 1) GROSS DOMESTIC PRODUCT:** is the total economic value of goods and services (expressed in US dollars) produced within the borders of a country in the course of a year and available for consumption in the market place.
- 2) GROSS NATIONAL PRODUCT:** *is the same but includes the value of all services produced at home and abroad.* A country such as Ghana will have a relatively similar GDP to GNP because it doesn't have many companies which produce things abroad: most production takes place within Ghana. America, on the other hand, which is where many Transnational Corporations are based, has a much higher GNP than GDP – Think about MacDonald's for example –all of those Big Macs sold outside of the USA won't appear in the GDP of the USA but will appear in the GNP.
- 3) GROSS NATIONAL INCOME:** a hideous oversimplification of this is that it's 'Gross Domestic Product + the additional income that self-employed people pay themselves +income received from abroad'. This matters to a lot of developing countries who don't produce much but have large diasporas, or populations living permanently abroad. Take Gambia for example– 1/6th of its GNI is from money sent by relatives who abroad, this would not be included in either GDP or GNP.
- You get slightly different country rankings if you use GNP or GDP rather than GNI. With a few exceptions most developing countries tend to have similar GDPs, GNPs and GNI's.
- If you look at India's Gross Domestic Product, it is the 7th richest country in the world, but if you look at its Gross National Income per Capita, it falls to 151st, due to its enormous population, but also due to the fact that it consumes a lot of the goods it produces itself, so it doesn't export much, so there's not a lot of income coming into the country.

An increasing GDP is often seen as a measure of welfare and economic success. However, it fails to account for the multi-dimensional nature of development or the inherent short-comings of capitalism, which tends to concentrate income and, thus, power.

One of the limitations of GDP is that it only addresses average income, failing to reflect how most people actually live or who benefits from economic growth. A growing GDP cannot be assumed to necessarily lead to sustainable development.

The predominance of GDP as a measure of economic growth is partly because it is easier to quantify the production of goods and services than a multi-dimensional index can measure other welfare achievements. Precisely because of this, GDP is not, on its own, an adequate gauge of a country's development. Development is a multi-dimensional concept, which includes not only an economic dimension, but also involves social, environmental, and emotional dimensions.

ALTERNATIVE MEASURES:

4) THE HUMAN DEVELOPMENT INDEX: One expanded indicator, which attempts to measure the multi-dimensional aspect of development, is the Human Development Index (HDI) conceived by the United Nations Development Programme (UNDP). Mahbud ul Haq and Amartya Sen developed the index, which is better suited to track the progress, not only of rich, but also of poor nations.

The Human Development Index (HDI) is a statistical tool used to measure a country's overall achievement in its social and economic dimensions.

The Human Development Index is a summary measure of average achievement in key dimension of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.

The Human Development Index (HDI) is a statistic composite index of life expectancy, education and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher. It was developed by Pakistani economist **Mahbub Ul Haq** .

Higher the index, higher the level of development of a country and vice versa

5) POVERTY RATE: The poverty rate is the ratio of the number of people (in a given age group) whose income falls below the poverty line; taken as half the median household income of the total population.

The second important indicator of economic underdevelopment is poverty. Not only per capita income is low, there is inequality in the distribution of income. Many people in LDCs do not get the minimum level of income necessary for a minimum caloric intake are said to be living below the poverty line. In India it is 25% at present.

It is easier to describe poverty than to measure it. Typically, poverty is defined in an absolute sense: a family is poor if the income falls below a certain level. The World Bank uses per capita GNP of less than \$480 as its criterion of poverty.

Poverty is also a relative concept. Family income in relation to other incomes in the country or region is important in determining whether or not a family feels poor.

PROPORTION OF POPULATION LIVING BELOW THE POVERTY LINE WITHIN A COUNTRY

The United Nations collects this data for countries with lower human development, but not for countries with high human development, and so here we are reliant on data from national governments or other agencies – and the problem here is that different countries measure their ‘poverty line’ in different ways, so this means making cross national comparisons are difficult.

So how useful is this ‘relative measure of poverty’ as an indicator of a country’s level of development?

- They give us far more insight than the GNI per capita PPP figures, because they tell us about income distribution. Can you really call a rich country developed if 15% of its population aren’t earning enough of an income to fully participate in that society?
- We also need them as an addition to the absolute figures of poverty – absolute poverty doesn’t exist in the wealthiest countries, but clearly relative poverty does.
- HOWEVER, the differences in how relative poverty figures are calculated does make it difficult to make comparisons.

- Also, some figures in the UN's data just don't seem believable – some ex-communist countries (such as Kazakhstan) report that only 5% of the population live below the country's poverty line – either the line is extremely low or there's maybe a little bit of mis-reporting going on?

The Percentage of People Living on Less than \$1.25 a day

There are still around 800 million people around the world living on less than \$1.25 a day (PPP), the figures for some of these countries are below:

- The Democratic Republic of Congo (88%)
- Bangladesh (47%)
- India (26%)
- China (6%)

Looking at absolute poverty statistics like this gives us a much fuller understanding of the lack of development in certain countries – in DRC, you can clearly see that poverty is endemic (absolute poverty is a significant problem in many Sub-Saharan African countries), and we can also see that absolute poverty is still a significant problem in India (mainly rural India) and while the 6% is quite low in China, this 6% represents 10s of millions of people, given the large overall population size.

6) OCCUPATIONAL PATTERN: Another important indicator of economic backwardness is occupational pattern. It is widely believed that the countries in which most of national output or national income is derived from the primary sector (i.e., agriculture, forestry, animal husbandry, mining etc.) are underdeveloped.

In other words, the greater the contribution of agriculture, the more economically backward a country is supposed to be. Most people in LDCs live in rural areas and work on farms. In India, for example, 70% of the total population depends on agriculture directly or indirectly.

In advanced countries most people work on factories or are engaged in trade and professions. Similarly, the contribution of agriculture and allied activities to net national product is quite high. In India, it is around 40% at present. In advanced countries the percentage is between 8 to 10.

As Misra and Puri have put it, “Most of the poor countries are essentially agricultural and even if some industries have been established in these countries, their impact is yet to be felt on the socio-economic life of the people.”

Evaluating the Usefulness of Economic Indicators of Development

Three Advantages of using GDP/ GNP/ GNI as an indicator of development

1. GNI figures provide a snap-shot indication of the huge difference between the more developed and less developed countries. In 2016, the GNP per capita in the UK was \$43000 while in India it was only \$1600. This means that there is 20 times as much money per person in the UK compared to in India
2. Gross National Income figures are also closely correlated with social development – generally speaking the higher the GNI per capita, the better the education and health indicators are in a country.
3. Total GDP figures give us an indication of who the most powerful nations are on earth in terms of military power. It's not a perfect correlation, but the USA, China, Russia and the UK are all in the top ten for GDP and they are the biggest arms producers and consumers in the world too.

Four limitations of using GDP/ GNP/ GNI as an indicators of development

1. Quality of life (Social Development) may be higher or lower than suggested by GNP per capita.
2. They don't tell us about inequalities within countries. The USA has one of the highest GNPs in the world but some extreme poverty.
3. A lot of production in developing countries may not be included. For example, **subsistence** based production is consumed locally in the community, and not sold in the market place. Similarly goods obtained illegally on the black market are not included in GNP measurement
4. They are very western concepts, equating production and economic growth with development. Some countries may not want economic growth and have different goals (Bhutan)

ENVIRONMENTAL INDICATORS

The natural environment plays an important role in supporting economic activity. It contributes:

- Directly, by providing resources and raw materials such as water, timber and minerals that are required as inputs for the production of goods and services; and

- Indirectly, through services provided by ecosystems including carbon sequestration, water purification, managing flood risks, and nutrient cycling.

Natural resources are, therefore, vital for securing economic growth and development, not just today but for future generations.

The links between the economy and the environment are manifold: the environment provides resources to the economy, and acts as a sink for emissions and waste. Natural resources are essential inputs for production in many sectors, while production and consumption also lead to pollution and other pressures on the environment. Poor environmental quality in turn affects economic growth and wellbeing by lowering the quantity and quality of resources or due to health impacts, etc. In this context, environmental policies can curb the negative feedbacks from the economy on the environment (and vice-versa). But how effective they are and whether they generate a net benefit or a net cost to society is the subject of much debate and depends on the way they are designed and implemented.

OECD (Organisation for Economic Co-operation and Development) is an intergovernmental economic organisation with 36 member countries, founded in 1961 to stimulate economic progress and world trade.

1)CLIMATE CHANGE

Main concerns relate to effects of increasing atmospheric greenhouse gas (GHG) concentrations on global temperatures and the earth's climate, and consequences for ecosystems, human settlements, agriculture and other socio-economic activities. This is because CO₂ and other GHG emissions are still growing in many countries, despite some progress achieved in decoupling CO₂ emissions from GDP growth (relative decoupling).

While a number of OECD countries have decoupled their CO₂ and other GHG emissions from GDP growth, most countries have not succeeded in meeting their own national commitments. Their emissions continued to increase throughout the 1990s, despite gains in energy efficiency. Overall, since 1980, CO₂ emissions from energy use have grown more slowly in OECD countries as a group than they have world-wide. This trend was emphasised in the recent years by the rapid economic growth of Asian countries.

2)OZONE LAYER

Stratospheric ozone depletion (e.g. over the Antarctic and the Arctic oceans) remains a source of concern due to the impacts of increased ultraviolet B radiation on human health, crop yields and the natural environment.

As a result of the Montreal Protocol, industrialised countries have rapidly decreased their consumption of CFCs (CFC 11, 12, 113, 114, 115) and halons . The targets set have been reached earlier than originally called for, and new and more stringent targets have been adopted.

Many countries reduced consumption to zero by 1994 for halons and by end of 1995 for CFCs, HBFCs, carbon tetrachloride and methyl chloroform. As of 1996, there has been no production or consumption of these substances in industrialised countries except for certain essential uses, but there are still releases to the atmosphere for example from previous production or consumption in industrialised countries.

3)AIR QUALITY

Main concerns relate to the effects of air pollution on human health, ecosystems, and buildings, and to their economic and social consequences. Human exposure is particularly high in urban areas where economic activities and road traffic are concentrated. Causes of growing concern are concentrations of fine particulates, NO₂, toxic air pollutants, and acute ground-level ozone pollution episodes in both urban and rural areas.

SO_x emissions have decreased significantly in many countries and have been successfully decoupled from fossil fuel use and economic growth (absolute decoupling). Emission intensities for SO_x show significant variations among OECD countries, depending among others on the countries' economic structure and energy consumption patterns. Total emissions have decreased significantly in a majority of the countries and European countries' early commitments to reduce Sox emissions have been achieved.

4)WASTE GENERATION

Main concerns relate to the potential impact from inappropriate waste management on human health and on ecosystems (soil and water contamination, air quality, land use and landscape).

Despite achievements in waste recycling and relative decoupling of municipal waste generation from economic growth, important questions remain on the capacities of existing facilities for final treatment and disposal, the location and social acceptance of new facilities (e.g. NIMBY for controlled landfill and incineration plants) and as to illegal shipments.

The amount and the composition of municipal waste vary widely among OECD countries, being directly related to levels and patterns of consumption and also depending on national waste management practices.

Over the last decade countries have succeeded in increasing the part of solid waste recycled. However, despite a reduction of its relative share, landfilling remains the predominant treatment for municipal waste in OECD.

5)FRESHWATER QUALITY

Main concerns relate to the impacts of water pollution (eutrophication, acidification, toxic contamination) on human health, on the cost of drinking water treatment and on aquatic ecosystems. Despite significant progress in reducing pollution loads from municipal and industrial point sources through installation of appropriate waste water treatment plants, improvements in freshwater quality are not always easy to discern, except for organic pollution. Pollution loads from diffuse agricultural sources are an issue in many countries, as is the supply of permanently safe drinking water to the entire population.

Due to varying settlement patterns, economic and environmental conditions, starting dates, and the rate at which the work was done, the share of population connected to waste water treatment plants and the level of treatment varies significantly among OECD countries: secondary and tertiary treatment has progressed in some, while others are still completing sewerage networks or the installation of first generation treatment plants. Some countries have reached the economic limit in terms of sewerage connection and use other ways of treating waste water from small, isolated settlements.

Those countries that completed their sewer systems long ago, now face considerable investment to renew pipe networks. Other countries may recently have finished an expansion of waste water treatment capacity and their expenditure has shifted to operating costs. Yet other countries must still complete their sewerage networks even as they build waste water treatment stations.

6) FRESHWATER RESOURCES

Main concerns relate to the inefficient use of water and to its environmental and socio-economic consequences: low river flows, water shortages, salinisation of freshwater bodies in coastal areas, human health problems, loss of wetlands, desertification and reduced food production. Although at the national level most OECD countries show sustainable use of water resource, most still face at least seasonal or local water quantity problems and several have extensive arid or semi-arid regions where water is a constraint to sustainable development and to the sustainability of agriculture.

Indicators of water resource use intensity show great variations among and within individual countries. The national indicator may thus conceal unsustainable use in some regions and periods, and high dependence on water from other basins. In arid regions, freshwater resources may at times be limited to the extent that demand for water can be met only by going beyond sustainable use in terms of quantity.

At world level, it is estimated that water demand has risen by more than double the rate of population growth in the last century. Agriculture is the largest user of water world-wide, accounting for about 70% of the total global freshwater withdrawals; abstractions for irrigation are estimated to have increased by over 75 % since 1960.

7)FOREST RESOURCES

Main concerns relate to the impacts of human activities on forest diversity and health, on natural forest growth and regeneration, and to their consequences for the provision of economic, environmental and social forest services. The main pressures from human activities include agriculture expansion, transport infrastructure development, unsustainable forestry, air pollution and intentional burning of forests. Many forest resources are threatened by degradation, fragmentation and conversion to other types of land uses.

Commercial exploitation of forests and related roundwood production has been increasing over the past thirty years, with some stabilisation over the 1990s, in particular in the OECD region. Over half of the roundwood produced in the world is used as a fuel, the rest for industrial production.

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Over the same period, the area of forests and wooded land has remained stable or has slightly increased in most OECD countries, but has been decreasing at world level due in part to continued deforestation in tropical countries.

8)FISH RESOURCES

Main concerns relate to the impacts of human activities on fish stocks and habitats in marine but also in fresh waters, and to their consequences for biodiversity and for the supply of fish for consumption and other uses. Main pressures include fisheries, coastal development and pollution loads from land-based sources, maritime transport, and maritime dumping. Many of the more valuable fish stocks are overfished, and the steady trend towards increased global fish landings is achieved partly through exploitation of new and/or less valuable species. Unauthorised fishing is widespread and hinders the achievement of sustainable fishery management objectives.

Of the major marine stocks fished world-wide, 23 % are estimated to be under or moderately exploited, 52% fully exploited, 17% overexploited and 8 % depleted or recovering. More than two third of stocks is exploited at or beyond maximum sustainable limit.

The intensity of national catches per capita varies widely among OECD countries, reflecting the share of fisheries and associated industries in the economy.

Catches from capture fisheries are generally growing at a slower rate than 30 years ago; they are even in decline in a number of countries, whereas aquaculture has gained considerable importance. Aquaculture helps to alleviate some of the stress from capture fisheries, but it also has negative effects on local ecosystems and its dependence on fishmeal products adds to the demand for catches from capture fisheries.

9)ENERGY RESOURCES

Main concerns relate to the effects of energy production and use on greenhouse gas emissions and on local and regional air pollution; other effects involve water quality, land use, risks related to the nuclear fuel cycle and risks related to the extraction, transport and use of fossil fuels. While some decoupling of environmental effects from growth in energy use has been achieved, results to date are insufficient and the environmental implications of increasing energy use remain a major issue in most OECD countries.

Variations in energy intensity among OECD countries are wide and depend on national economic structure, geography (e.g. climate), energy policies and prices, and countries' endowment in different types of energy resources.

10)BIODIVERSITY

Main concerns relate to the impacts of human activities on biodiversity. Pressures can be physical (habitat alteration and fragmentation through changes in land use and cover), chemical (toxic contamination, acidification, oil spills, other pollution) or biological (alteration of population dynamics and species structure through the release of exotic species or the commercial use of wildlife resources). While protected areas have grown in most OECD countries, pressures on biodiversity and threats to global ecosystems and their species are increasing. Many natural ecosystems have been degraded, limiting the ecosystem services they provide.

The number and extent of protected areas has increased significantly since 1980 in almost all countries, reaching 13% of territorial area for the OECD as a whole. Actual protection levels, management effectiveness and related trends are more difficult to evaluate, as protected areas change over time: new areas are designated, boundaries are revised and some sites may be destroyed or changed by pressures from economic development or natural processes.

This indicator still shows a high percentage of species threatened, particularly in countries with a high population density, and a high level of concentration of human activities.

In most countries, a significant share of species are threatened not only by habitat loss or alteration inside protected areas, but also by changes in land use categories and intensity

outside protected areas (e.g. agriculture, forestry, etc.). In general, little progress is being made to slow habitat loss and fragmentation outside protected areas.

HUMAN DEVELOPMENT INDEX

The Human Development Index is a summary measure of average achievement in key dimension of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.

The HDI was created to emphasize that people and their capabilities should be ultimate criteria for assessing the development of a country, not economic growth alone. The HDI can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with different human development outcomes.

The **Human Development Index (HDI)** is a statistic composite index of life expectancy, education and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher. It was developed by Pakistani economist **Mahbub Ul Haq** , with help from Gustav Ranis of Yale University and Meghnad Desai of the London School of Economics, and was further used to measure a country's development by the United Nations Development Programme (UNDP)'s Human Development Report Office.

‘THE REAL WEALTH OF A NATION IS ITS PEOPLE. AND THE PURPOSE OF DEVELOPMENT IS TO CREATE AN ENABLING ENVIRONMENT FOR PEOPLE TO ENJOY LONG, HEALTHY, AND CREATIVE LIVES. THE SIMPLE BUT POWERFUL TRUTH IS TOO OFTEN FORGETTED IN THE PURSUIT OF MATERIAL AND FINANCIAL WORLD. ‘

- MAHBUB UL HAQ

The Human Development Index (HDI) is a statistical tool used to measure a country's overall achievement in its social and economic dimensions.

The Human Development Index (HDI) was established to place emphasis on individuals, more precisely on their opportunities to realize satisfying work and lives. Evaluating a country's potential for individual human development provides a supplementary metric for evaluating a

country's level of development besides considering standard economic growth statistics, such as gross domestic product (GDP).

This index can also be used to examine the various policy choices of nations; if, for example, two countries have approximately the same gross national income (GNI) per capita, then it can help to evaluate why they produce widely disparate human development outcomes.

Proponents of the HDI hope it can be used to stimulate such productive public policy debate.

How Is the HDI Measured?

The HDI is a summary measurement of basic achievement levels in human development. The computed HDI of a country is an average of indexes of each of the life aspects that are examined: knowledge and understanding, a long and healthy life, and an acceptable standard of living. Each of the four components is normalized to scale between 0 and 1, and then the geometric mean of the three components is calculated.

HEALTH DIMENSION OF HDI

The health aspect of the HDI is measured by the life expectancy, as calculated at the time of birth, in each country, normalized so that this component is equal to 0 when life expectancy is 20 and equal to 1 when life expectancy is 85.

EDUCATION DIMENSION OF HDI

Education is measured on two levels: the mean years of schooling for residents of a country and the expected years of schooling that a child has at the average age for starting school. These are each separately normalized so that 15 mean years of schooling equals one, and 18 years of expected schooling equals one, and a simple mean of the two is calculated.

LIVING STANDARD DIMENSION OF HDI

The metric chosen to represent the standard of living is GNI per capita based on purchasing power parity (PPP), a common metric used to reflect average income. The standard of living is normalized so that it is equal to 1 when GNI per capita is \$75,000 and equal to 0 when GNI per capita is \$100. The final Human Development Index score for each country is calculated as a geometric mean of the three components by taking the cube root of the product of the normalized component scores.

